TECHNOLOGY

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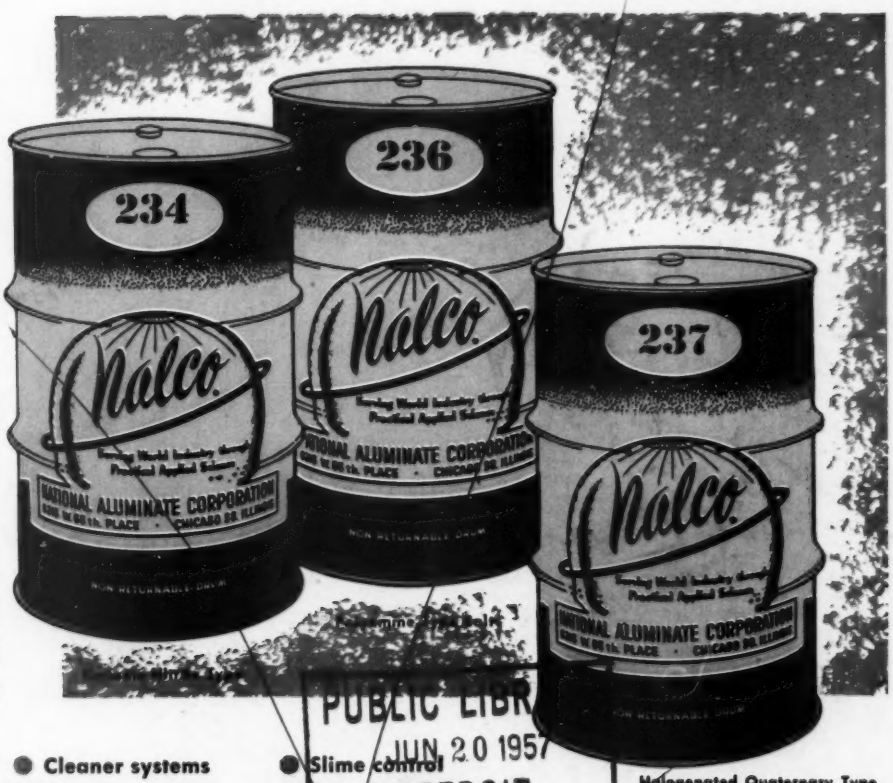

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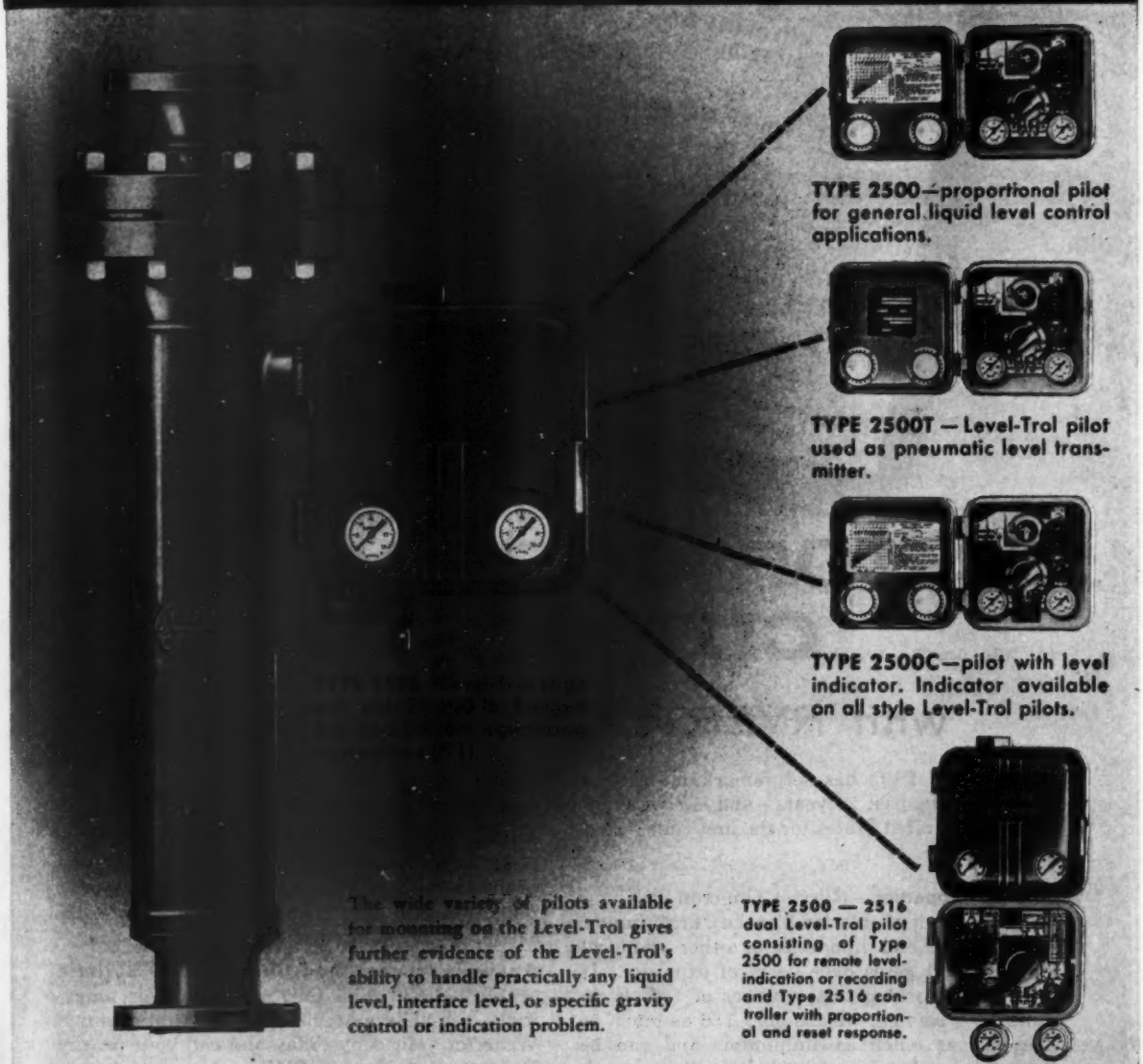

TYPE 2500—proportional pilot for general liquid level control applications.

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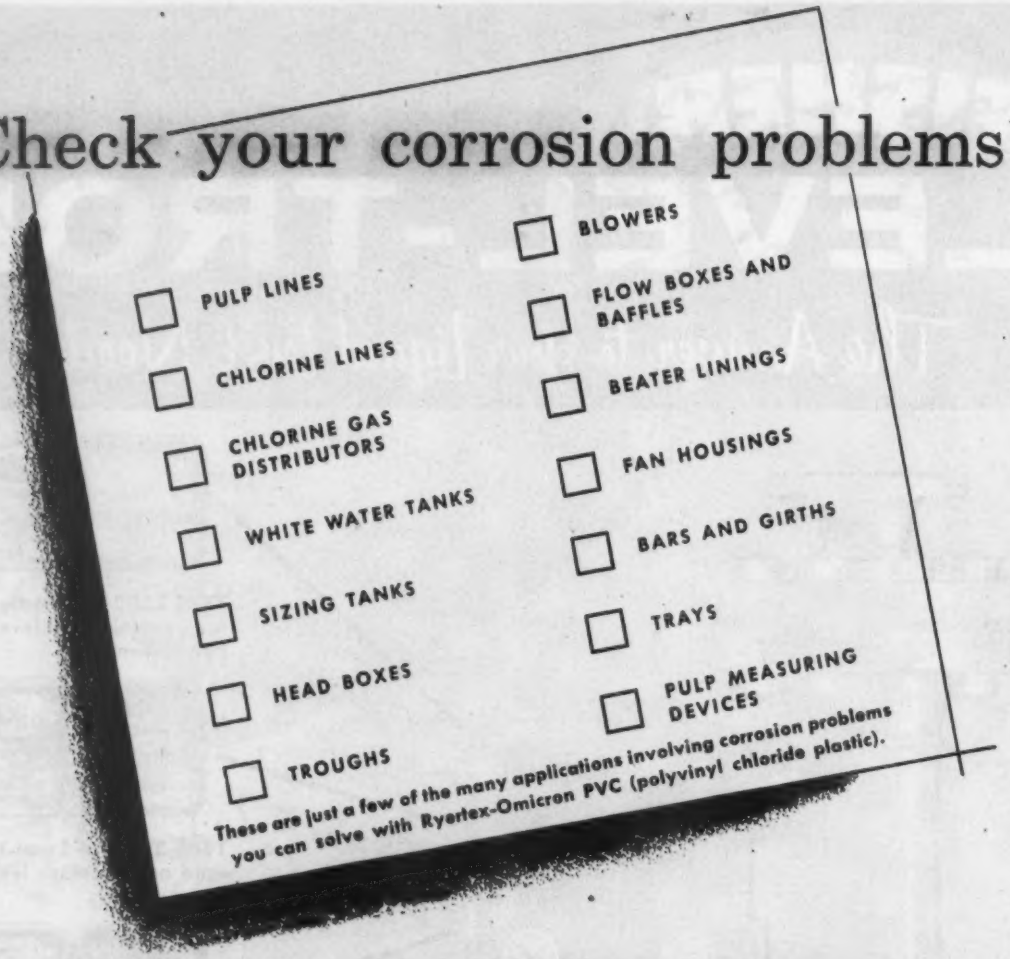
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Technology • Engineering • Management • Production

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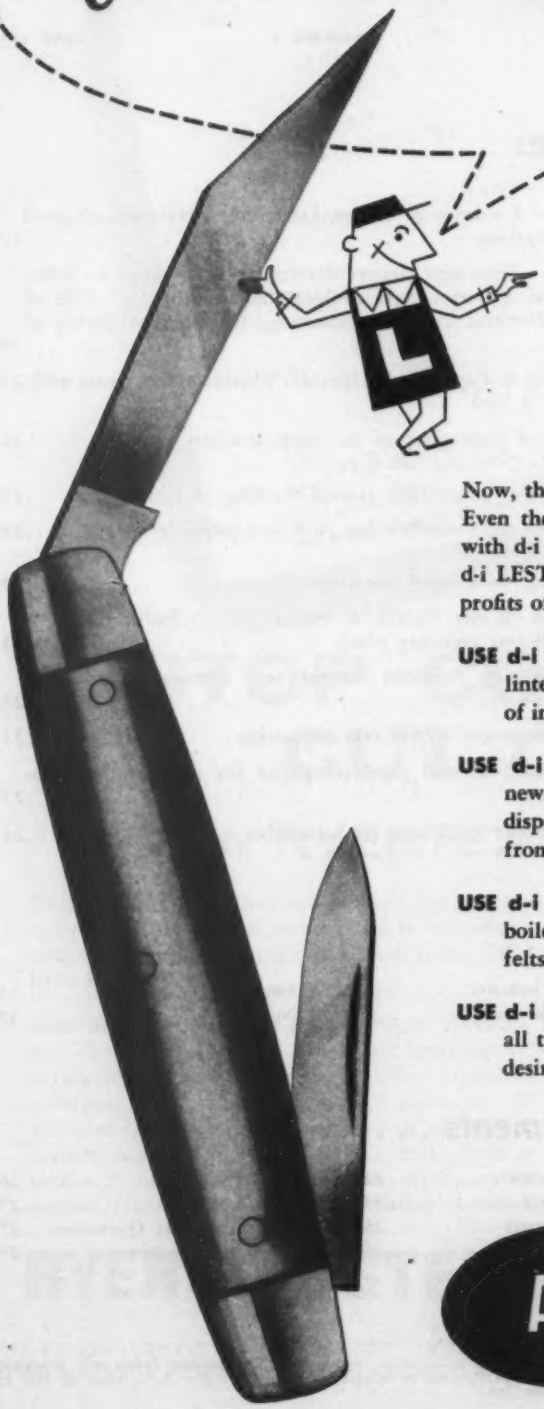

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From our point of view . .

A maximum of benefits from a maximum of good communications

Good communication is rapidly becoming one of the most important links that holds a complex industrial establishment together. No longer can management, employees and a community remain in non-communicating isolation from one another and still gain the reputation as a progressive management, an enlightened labor force, and a future-planning community.

The importance of good communications is nothing new to the communications-minded American Pulp & Paper Mill Superintendents Association; and for this reason it was not surprising that a considerable number of papers presented at the 38th annual convention was devoted to this subject in its various ramifications.

Few in our civilization will disagree with such concepts or advantages of good communications as: (1) They are a prerequisite to good supervision and good relationship with the employees and the community; (2) they are essential to quality production, safety, economy of operation and increased productivity in general; (3) they will contribute to the birth of a new idea and to the rapid translation of a new idea into practical application; (4) they will reduce absenteeism, and (5) they will create a more receptive attitude on the part of the community toward the operating plant. Needless to say that any of these programs, if initiated and/or followed up by inadequate communications, will seldom survive to the point of successful accomplishment.

All these advantages are widely appreciated, and for that reason the majority of mills does observe various minimum standards of good communications.

However, it is not so widely appreciated that the real advantages come with a greater proficiency in the art of communications. As so aptly pointed out by Lucille La Chapelle, in order to put your ideas across more effectively, "you have to sound as good as you are" or, in other words, "let the mind, the body, and the voice say the same thing".

As a further refinement in the art of good communications, Ralph G. Nichols of the University of Minnesota advocated a better understanding of the psychology of persuasion. The man who has an understanding of the psychology of persuasion, he said, acquires "mobility". He moves with surprisingly little friction through the maze of problems that are the daily routine in a world of controversy. He wins arguments and promotes policies without creating hostility and without developing ulcers.

The better the communication, the more numerous the benefits. Ideologically, this concept is not new; but it is often surprising to see how well it works in practical application.

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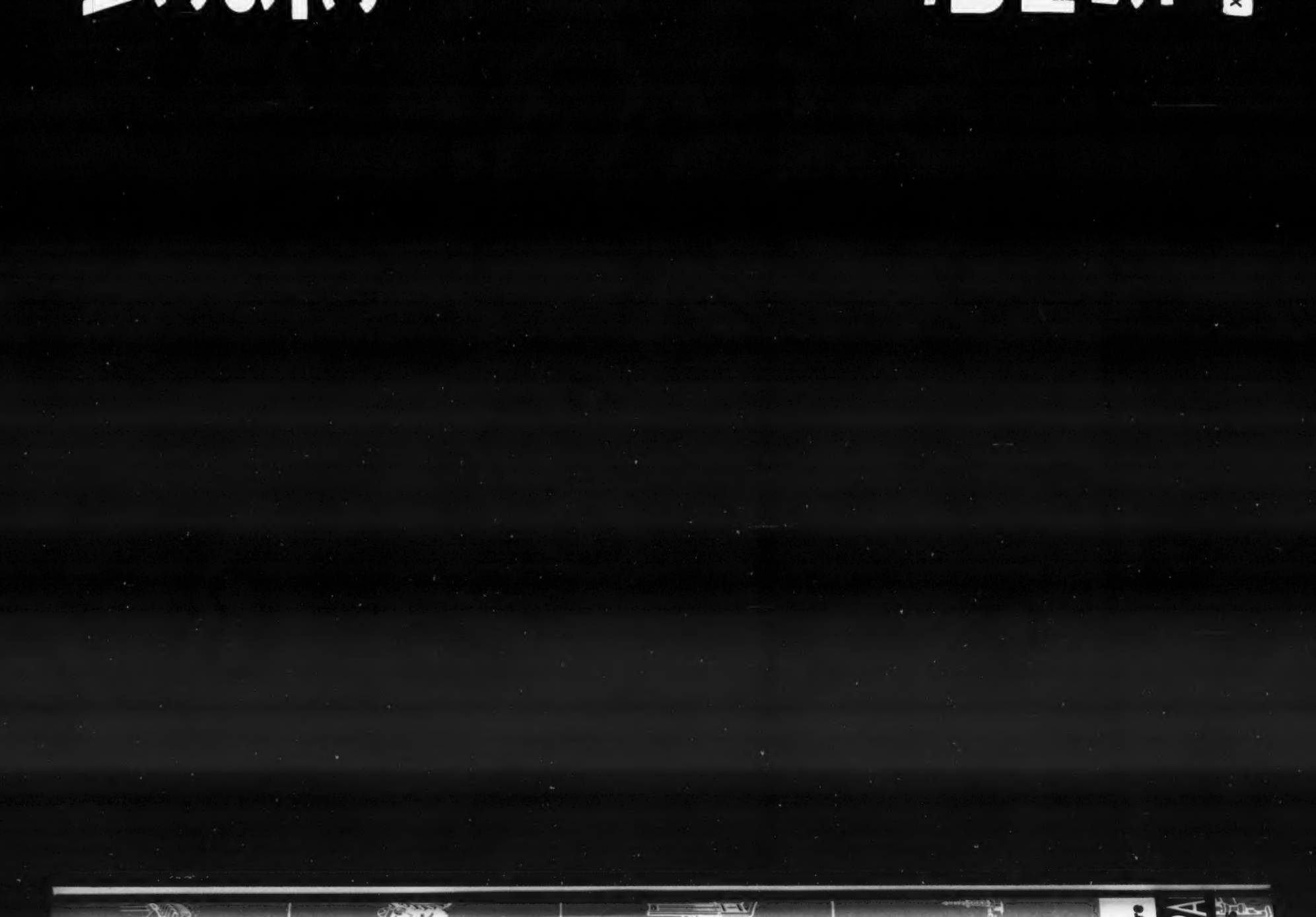
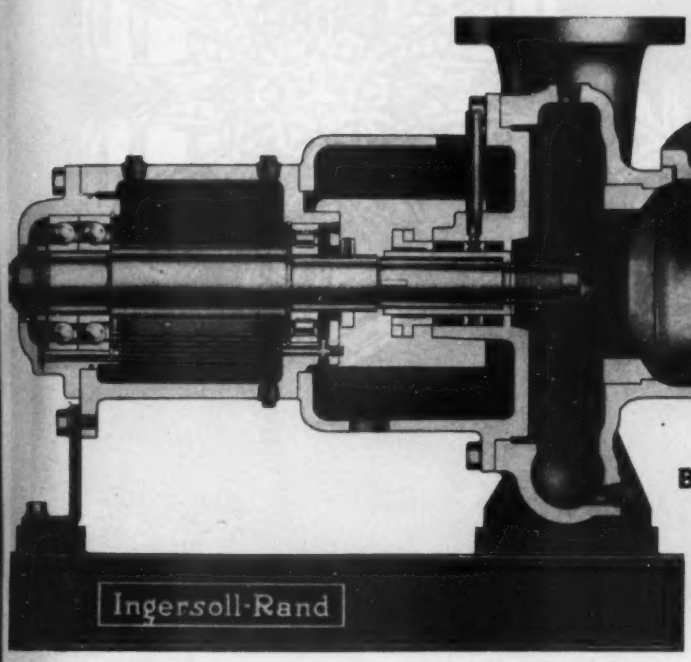
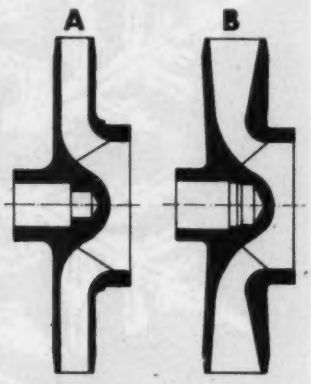


Ingersoll-Rand All-Purpose stock pumps



A. CONVENTIONAL IMPELLER for normal stocks
As the drawing clearly shows, the conventional impeller decreases in width from center to periphery. This impeller is completely adequate and more efficient for handling stocks up to 4% consistency.



B. DIVERGING IMRELLER for heavy stocks
This patented I-R impeller differs from the conventional impeller in that its width increases from center to periphery . . . therefore it has much greater area at discharge than at inlet. Hence material cannot enter fast enough to replace ejected material, and vacuum is formed between blades. Entrained-air or gas enters vacuum space and passes through without vapor binding; solids and slurries pass through without abrupt acceleration and with lower velocities.

Now a single line of pumps handles both normal stocks and heavy stocks!

Simply by selecting the right impeller for your particular stock pumping problem (see explanation above), you can handle *normal* stocks up to 4% consistency . . . or *heavy* stocks up to 10% consistency and large amounts of entrained air! The same Ingersoll-Rand All-Purpose pump does both jobs . . . *the two types of impellers are completely interchangeable.*

All you need do to switch from normal to heavy stock pumping is remove the *conventional* impeller and casing ring . . . and replace it with the patented *diverging* impeller and casing ring.

Between the heavy-duty pump and the normal-duty pump, all parts are identical . . . except for the two types of impellers and their casing rings. This means you save *at least* 50% on stocking spare parts . . . one set of parts will serve pumps on two types of service.

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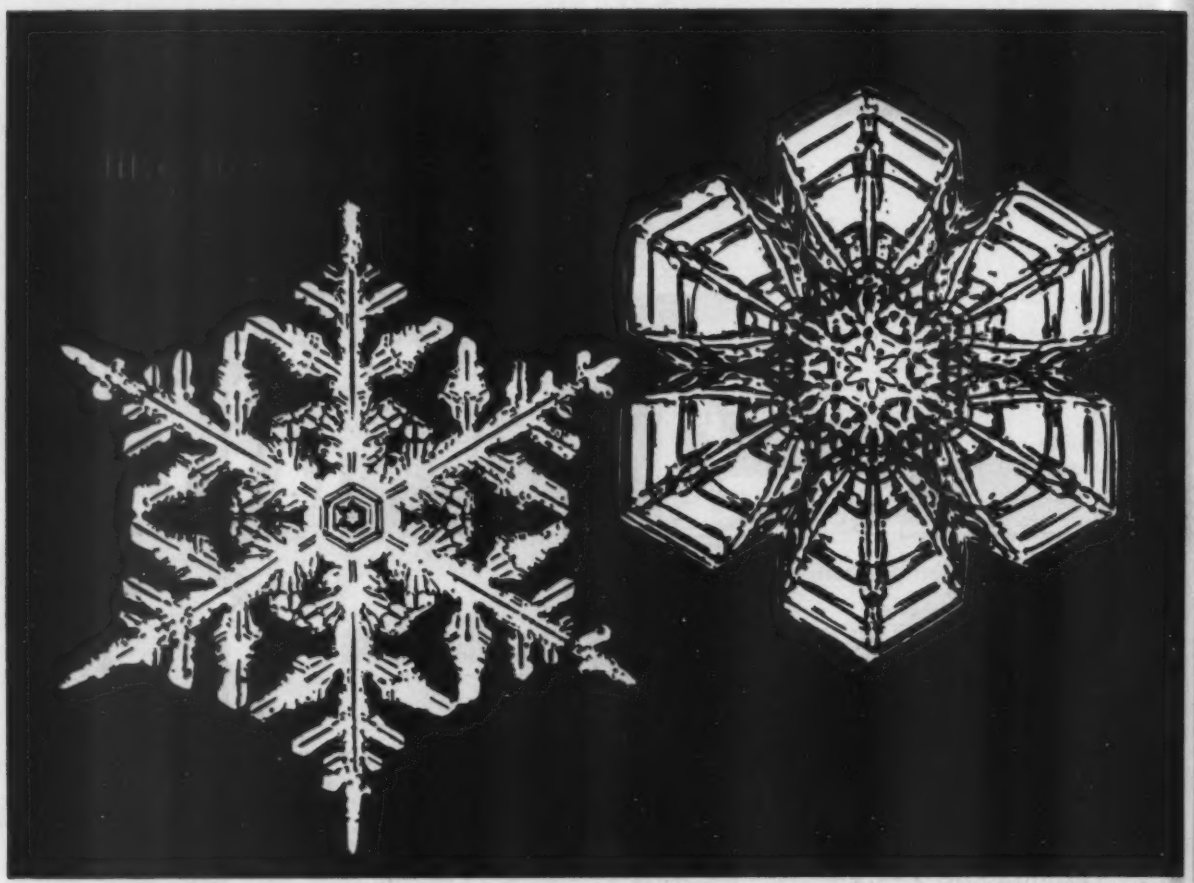

(Microphotographs of snow flakes)

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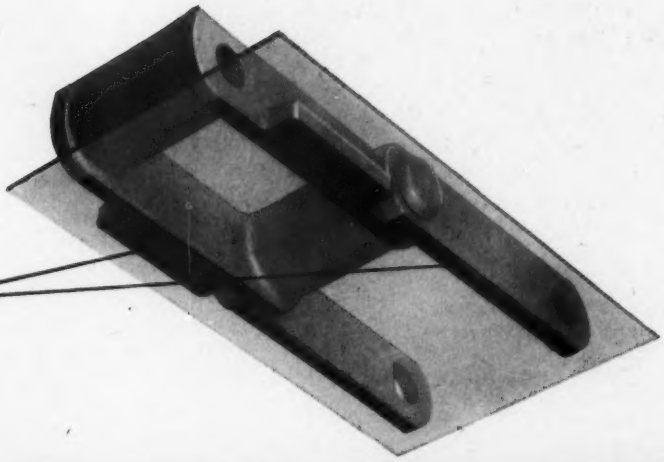
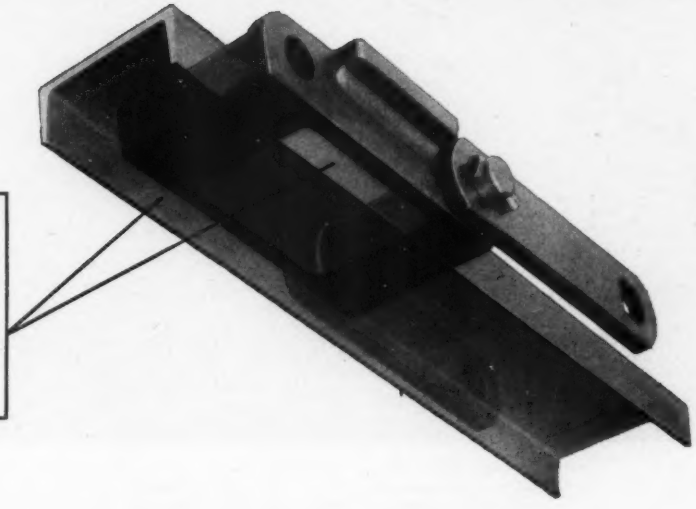
19.7 sq. in.
of sliding surface per foot of PW-132 chain on the carrying strand.



20.2 sq. in.
of sliding surface per foot of PW-132 chain on the return strand.



JEFFREY PW® (PATENTED) CHAIN provides 50% more wearing surface than ordinary chain

Longer chain life results when you install Jeffrey PW combination chain. There's 50% more surface in contact with the trough and return runways, so wear is correspondingly reduced. You avoid downtime and save on upkeep.

PW type combination chain is interchangeable with the regular combination chain of similar size. Can be furnished in malleable iron or SUPERMAL. The overall width of the shoes is the same, so they will operate over the same sprockets and in the same troughs. Both employ the same attachments for log-handling service.

Ask your nearby Jeffrey representative or distributor to quote on PW chain as a means of cutting your operating costs. The Jeffrey Manufacturing Company, Columbus 16, Ohio.

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View of one section of the conditioning room at the main plant, Albany, N. Y., the many colors and shades indicating the wide variety of specialized chemical treatments daily being applied to Albany felts, each proven by performance as best for its particular application.

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Albany's extensive research program is constantly improving existing treatments and developing new ones to meet your demands.

Worker supervises and regulates application of one of many specific-purpose chemical treatments to felts in Albany's finishing department.

YES, Albany Felt's advanced chemical treatments *can improve your felt performance* — in roughly 60% of the positions clothed. This percentage represents the share of Albany's felt production currently receiving one *or more* chemical treatments. As the industry's pioneer in the field of chemical treatments, Albany has a wide range of varied treatments, since *no one formula* has been developed to answer *every* demand! These include the B and D series which improve starting and wetting; the W-6 Treatment to provide bacterial control; Z-5 for alkali resistance; and the F, H, J and U series which offer resistance to wear, hardening, filling and stretch in varying degrees dependent upon the desired application. In all, more than 20 of these treatments are at work today, *each solving a specific problem better!* Ask your Albany Sales Engineer for information on those best suited to your needs—his goal, as always, to help you produce *more saleable tons per day!*

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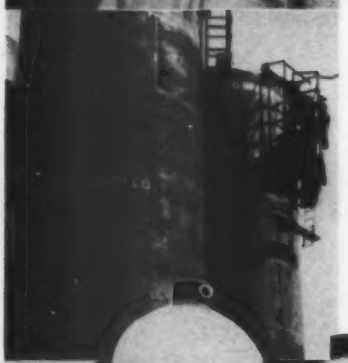


At Weyerhaeuser's new sulphite mill:

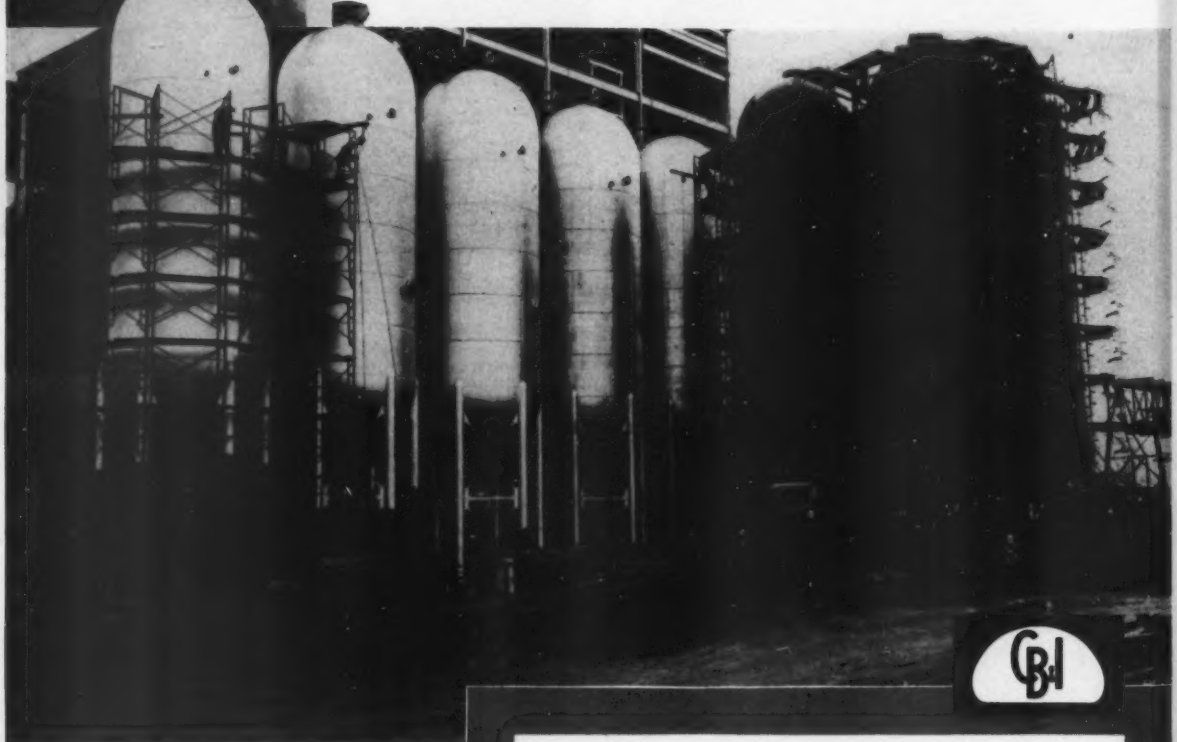
CB&I-built Digesters and Accumulators are field erected and stress relieved

CB&I Field Services *went to work* at Weyerhaeuser's new 400-ton sulphite pulp mill—recently completed at Cosmopolis, Washington. The 7 CB&I digesters and 4 accumulators were stress relieved in the field. All welds were similarly checked by specially designed, non-destructive X-ray examination equipment.

By erecting as well as fabricating structures such as those completed at Weyerhaeuser, CB&I is able to offer its customers an exceptionally high degree of quality control between the shop and field. Our field service program offers experience, equipment and on-the-job know-how to handle your most specific requirements. Write our nearest office for the new bulletin on *Field Erection Services.*

Top: CB&I specialist uses portable X-ray machine for examination of seam welds.

Left: Automatic (patented) girth welder being adjusted for welding circumferential joints on accumulator.



Left: 60-foot high digesters are 17 feet in diameter.

Right: Four accumulators have 1,290 cubic foot capacity each.

PP22

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SF announces

FLAKT DRYER

Number 208

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SF PULP PRE-HEATER *located before the last press. Part of the new Palatka installation, it utilizes heat in the exhaust air from the Flakt Dryer for heating the pulp sheet, thereby eliminating the need for live steam.*

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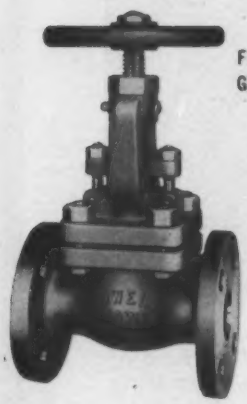

FIG. 2475—Stainless Steel O.S. & Y. Globe Valve for 150 Pounds W.P.

FIG. 2309 SW—150-Pound Flush Bottom Tank Valve with Powell Patented Seat Wiper.

FIG. 2456 SG—Large Stainless Steel Gate Valve for 150 Pounds W. P. Flanges conform to latest Standards.

FIG. 2433 SS—Large Stainless Steel Swing Check Valve for 150 Pounds W.P.

Designed for long life, designed for dependable service

Consult your Powell Valve distributor for all the facts about quality proved bronze, iron, steel and corrosion-resistant valves. No matter what the flow control problem, a Powell Valve can solve it . . . *better.*

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No wonder so many leading papermakers use Clinton enzyme conversion starches. They convert prospects to customers!

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RESISTANCE TO TENSILE STRESS is achieved with properly heat-treated, accurately machined side bars made of premium steel and fitted with properly hardened pins, bushings, rollers.

STRENGTH OF CHAIN IN MOTION results from such refinements as pitch-hole preparation, micro-finish of parts, special processing of side bars, pre-lubrication, rigid quality control.

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These include lock-type bushings, shot-peened rollers, pre-stressing, closer heat-treat control. The result: a precision chain that takes stresses in stride . . . provides smoother, more efficient performance that measurably outlasts ordinary roller chain — reduces costs.

For full data on Link-Belt roller chain, see your Link-Belt office or authorized stock-carrying distributor.

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ROLLER CHAIN & SPROCKETS

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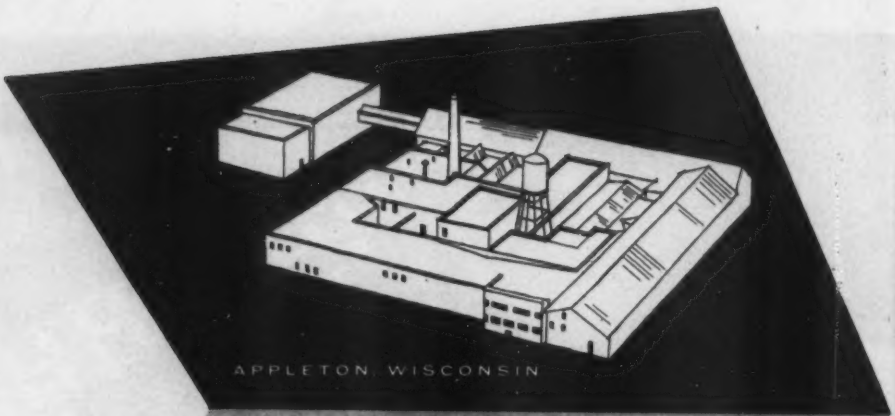
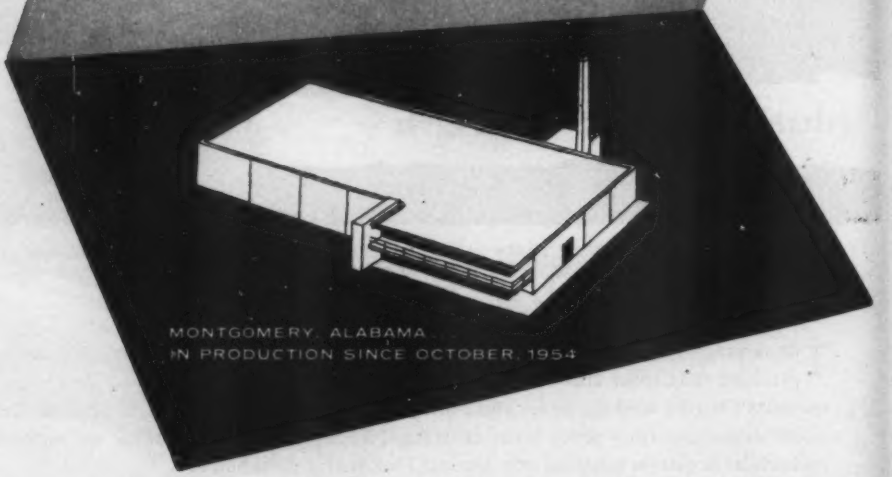


APPLETON, WISCONSIN

Confidence....in the paper industry

Foresight.....to anticipate changing conditions and requirements of the paper industry with new manufacturing facilities



MONTGOMERY, ALABAMA
IN PRODUCTION SINCE OCTOBER, 1954

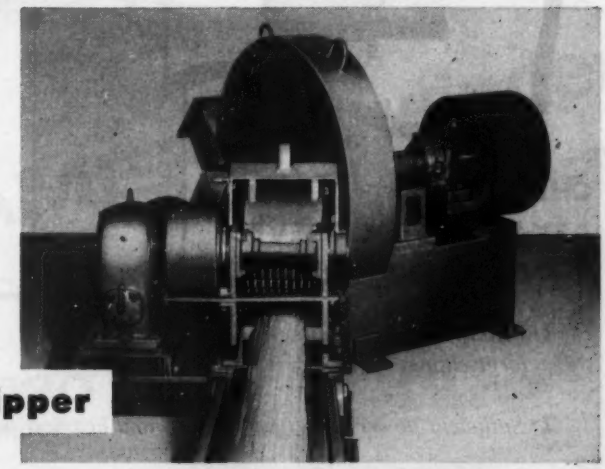
Appleton Wires are Good Wires

Appleton Wire Works, Inc.
GENERAL OFFICES, APPLETON, WISCONSIN

Convert Slabs and Edgings into Valuable Pulpwood

with a Carthage Slab Barker

The new Carthage Slab Barker removes bark by scraping, rather than flailing, and does a thorough job without splintering the wood. Operation is safe, with minimum maintenance. Three barking heads, hydraulically adjustable to fit the contour of the slab, are equipped with scrapers welded on steel roller chains. Power feed is foot controlled, leaving operator's hands free to adjust barking heads to each slab. Capacity, 1.5 to 2 cords of rough slabs and edgings per hour. Maximum slab size, 16" wide and 7" thick. Ask for Bulletin No. SB-10A.



. . . and a Carthage Slab Chipper

With power feed synchronized with the cutting speed, the Carthage 39" Slab Chipper produces uniform, clean-cut chips exceptionally free from bruising. Capacity 3 to 5 cords per hour. Heavy feed fingers at the disc hold down and align short ends, and safety bar prevents entrance of oversize material. Feed stops automatically if spout is accidentally jammed. Horizontal feed spout simplifies handling of long slabs and permits "automated" chipping when fed with the same conveyor used to take slabs away from the Carthage Slab Barker. (Ask for Bulletin 39-1)

. . . Complete the Job with a Carthage-Dillon Vibrating Chip Screen (Write for Bulletin)

Ask Your Carthage Representative:

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1735 Ocean Front
Ph. Jacksonville Elgin 4-4516

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Box 490, Ph. Lyric 2-1042

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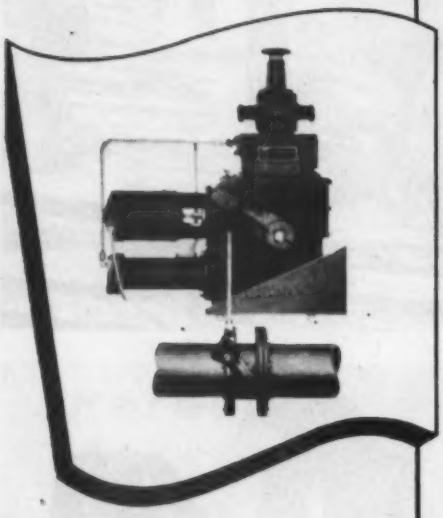
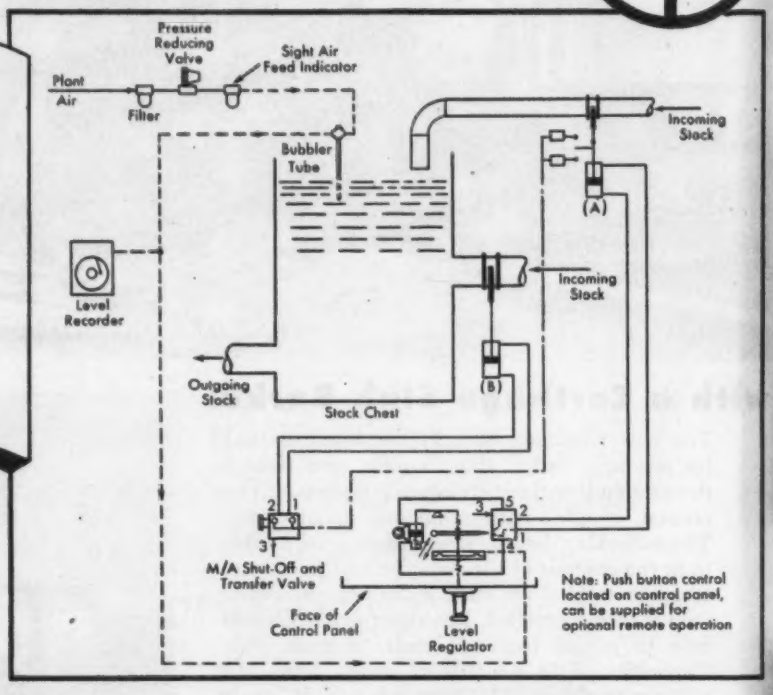
CARTHAGE MACHINE COMPANY
CARTHAGE, NEW YORK

Askania Regulator Company NEWS

Controls for: Thin Stock Consistency, Stock Level, Flow, Pressure, Edge Position of Screens and Felts





CHECK THESE ASKANIA STOCK LEVEL CONTROL FEATURES:

1. *Instant response to either small or sudden large changes in stock level*
2. *Sufficient power to actuate largest and heaviest valves*
3. *Operation of minimum and maximum flow valves in sequence*
4. *Unlimited turndown*
5. *Lowest maintenance cost for any stock level control element*

HOW IT WORKS

When the stock level deviates from the desired level, static pressure registered in the bubbler tube changes, and a signal is sent to the Jet Pipe Regulator which actuates the Hydraulic Cylinder "A" connected to the gate valve in the upper incoming line. Deviations of moderate magnitude are thereby corrected. However, when a major deviation from the desired level occurs, the piston is displaced to either end of cylinder "A" and thereby closes a limit switch, causing one solenoid of the Askania-Automatic Sequence Valve to be energized. The large piston "B" will then be displaced and thereby open or close the larger gate valve for corrective action until the level regulator causes the small piston to move from the list switch back into mid-range control.

ASKANIA POWERPACK

The Askania Powerpack Regulator is an example of a rugged and self-contained controller ideally suited for this application. Control relay, pump, and hydraulic cylinder are combined into one compact dependable unit. Liquid level, flow rate, pressure, etc. are readily controlled with this unit. By utilizing the knee action inherent in all Askania crank connections, the Powerpack cylinder provides maximum torque and slowest speed for small adjustments when valve is near its closed position.

Send today for bulletin 165 describing the POWERPACK and bulletin 26.3 describing ASKANIA Stock Level Controls. Write Askania Regulator Company ...294 E. Ontario St., Chicago 11, Ill.

ASKANIA REGULATOR COMPANY
"CONTROLS FOR INDUSTRY"
HYDRAULIC, ELECTRONIC CONTROLS & SERVOS, GENERAL SYSTEMS, ENGINEERING & COMPUTER SERVICE, VALVE ACTUATORS & CYLINDERS

A SUBSIDIARY OF
GENERAL PRECISION EQUIPMENT CORPORATION

CAMERON 460
a new high-speed winder

...speeds up to 5000 fpm
...quick-set shear-cut or score-cut slitting
...widths to suit requirements
...maximum rewind capacity 72"
...automatic riding roll lift
...automatic rewind shaft lift
...automatic roll ejector *

Send for free Bulletin 3030

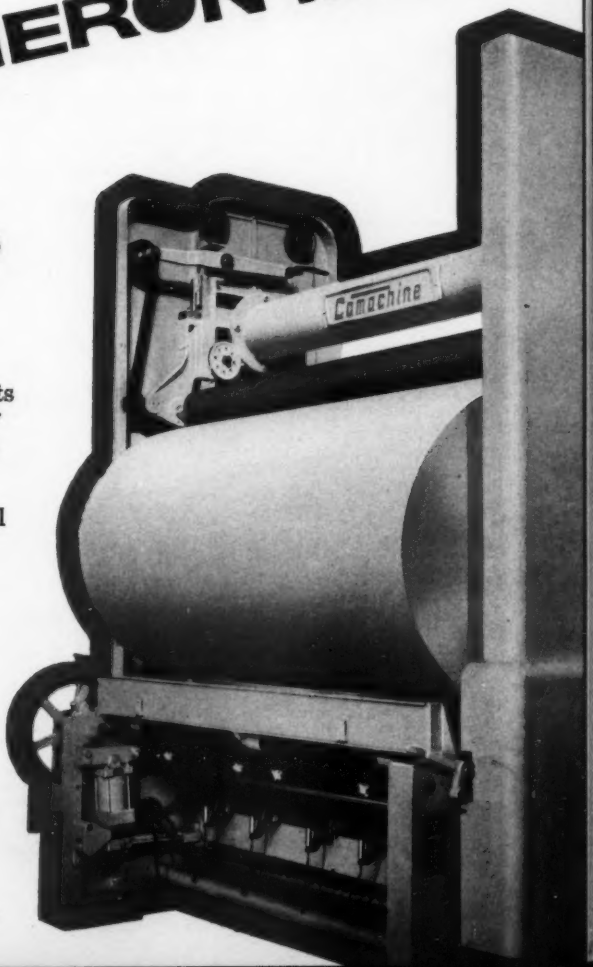
2 great new CAMERON winders

CAMERON 430
a new slitter-rewinder

...speeds up to 3000 fpm
...score-cut or shear-cut
...widths to suit requirements
...maximum rewind capacity 60"
...automatic riding roll lift *

* optional

Send for free Bulletin 3035



CAMERON MACHINE COMPANY • 61 Poplar Street • Brooklyn 1, N. Y.

460 and 430... two highlights in Cameron's sweeping new design program... setting new highs in production of quality rolls, new lows in operating cost... featuring dynamic new engineering developments by Cameron's

team of specialists

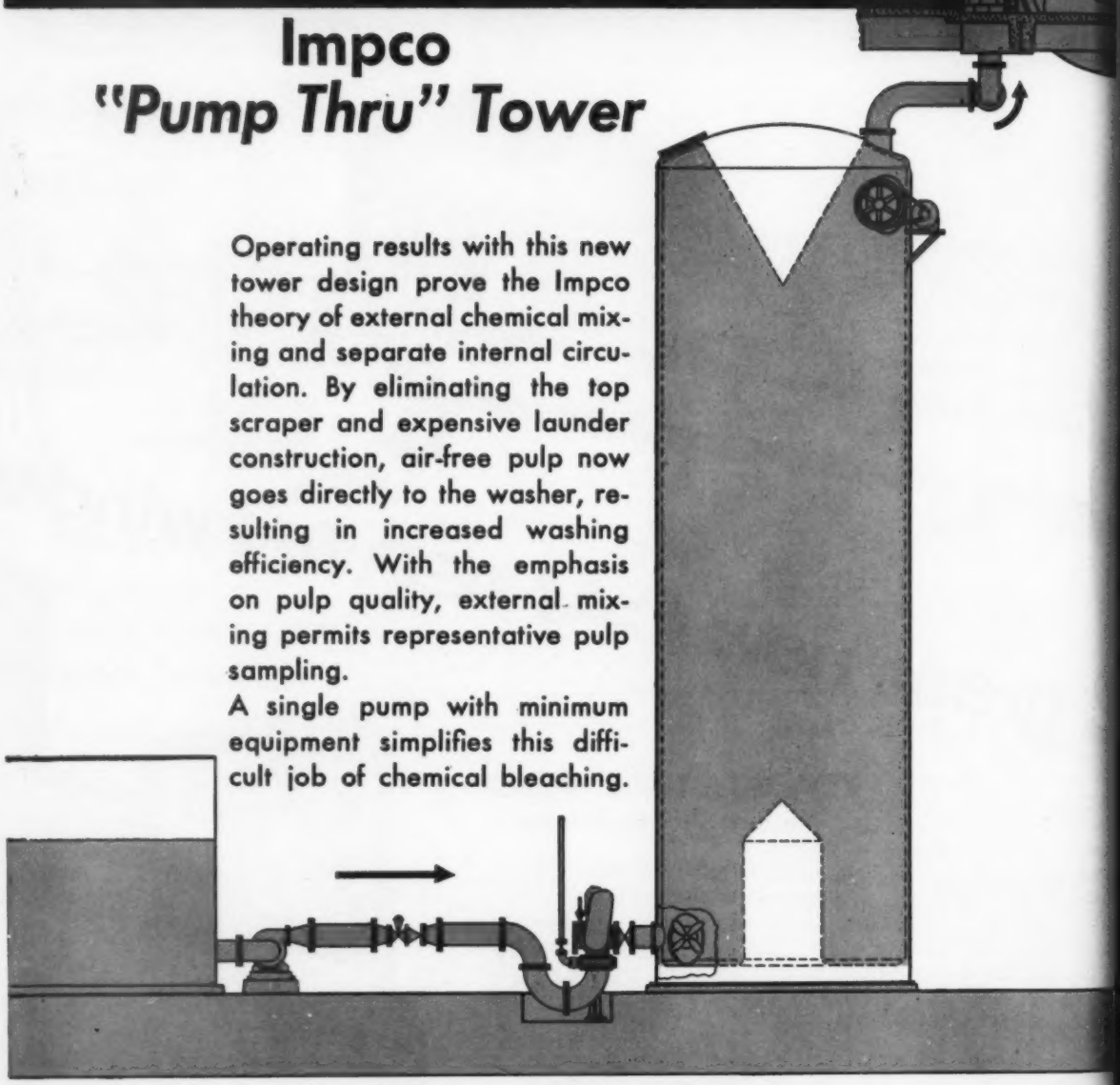
AA-329

the Modern Low Density Bleaching Technique

Impco
"Pump Thru" Tower

Operating results with this new tower design prove the Impco theory of external chemical mixing and separate internal circulation. By eliminating the top scraper and expensive launder construction, air-free pulp now goes directly to the washer, resulting in increased washing efficiency. With the emphasis on pulp quality, external mixing permits representative pulp sampling.

A single pump with minimum equipment simplifies this difficult job of chemical bleaching.



IMPCO®

IMPROVED MACHINERY INC.

NASHUA · NEW HAMPSHIRE

In Canada, Sherbrooke Machineries Limited, Sherbrooke, Quebec

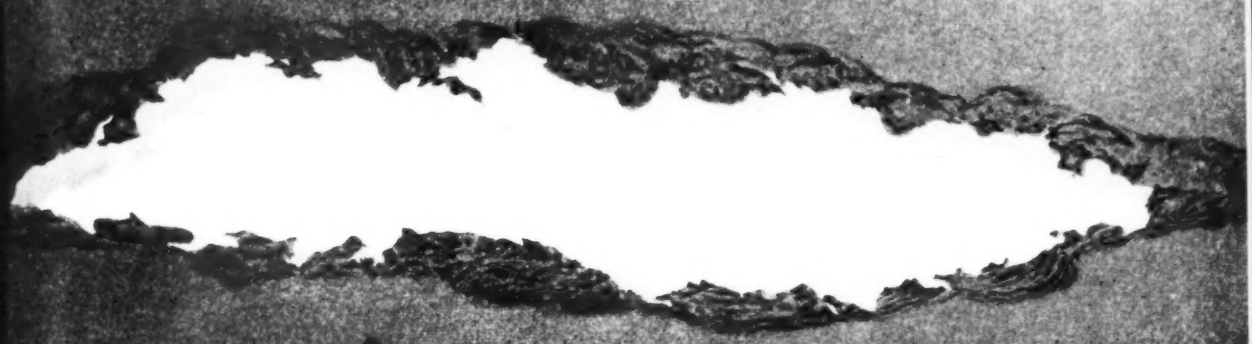
2-point slime control plan

first scientific solution to the slime problem

1

Add a bacteriologist or chemist to your staff without cost!

The Technical Service Representative from United States Movidyn Corporation is university-trained, and thoroughly experienced in slime control. His job is *service* rather than selling, and he'll work with you for as long as he's needed. Using the compact mobile laboratory carried in his car (or your mill laboratory) he'll analyze and solve your slime problem under actual operating conditions—and at no additional cost to you!



2

One product can solve your slime problem economically!

No need to alternate with any other slimicides! SLIMODYN contains three powerful heavy metal toxicants for use in most white water systems. MICRODYN is specially formulated for application in paper mills where mercurials are objectionable. SLIMODYN and MICRODYN, being completely dispersible in water, are suitable for spraying after washups, and adsorb readily on surfaces to build a residual germicidal activity. They are relatively unaffected by changes in pH; will not shorten wire life or cause foaming.

For complete information, contact

UNITED STATES

Movidyn CORPORATION

863 N. Orleans Street
Chicago 10, Illinois
Telephone WHitehall 3-1530
Cable: MOVIDYN

Feature articles

Hudson Pulp & Paper Corp. operates Florida's first tissue mill

A. W. J. DYCK

The expansion includes (1) a 15,000,000-gal. per day water treatment plant; (2) a 200-ton per day four-stage bleach plant; (3) a 150-ton per day pulp dryer; (4) an 80-ton per day tissue machine; (5) new steam and power generating facilities, and (6) fully equipped—complete with conveyors—finishing, converting and shipping facilities.

FLORIDA'S FIRST tissue mill came into existence with the opening of Hudson Pulp & Paper Corp.'s 80-ton per day capacity multimillion dollar plant at Palatka on February 8, 1957. The mill manufactures two-ply toilet tissue, facial tissue, napkins and hankies. Already in operation at Palatka since 1947 were Hudson Paper's facilities for manufacturing kraft paper tapes, bags, multiwall sacks and related products.

Designed by J. E. Sirrine Co. for maximum efficiency of operations, the new expansions feature (1) the 228-in. tissue machine, (2) power generating and power control systems that permit control of several manufacturing processes from one location, (3) streamlined traffic, materials handling and process flow, (4) a unique recovery and cooking liquor preparation system, (5) an automatic conveying system to carry cases of finished product to the warehouse or shipping docks, and (6) an ultra modern water treatment plant that processes 15,000,000 gallons of water per day.

Chip preparation

A 236-ft. long, 125-fpm log conveyor, with a capacity of 40 cords of 5-ft. pulpwood per hour, conveys the logs to the barking drums. The conveyor is driven by a 40-hp. 1800-rpm motor equipped with a No. 5½ G.D.A. speed reducer (ratio 27:1) and an 8F coupling. It has a one-strand AL32 Z metal chain with cadmium-plated rivets and special K-12 attachments every 12th pitch.

The transfer chute at the head of this conveyor is designed to permit an even distribution of logs—as they are transferred to another conveyor, thus preventing surge loading at the barking drum.

The logs enter two 12-ft. by 67½-ft. L M-bar chain-suspended barking drums, each drum consisting of two dry sections and one wet outlet sec-

R. Paradis
Res. Manager

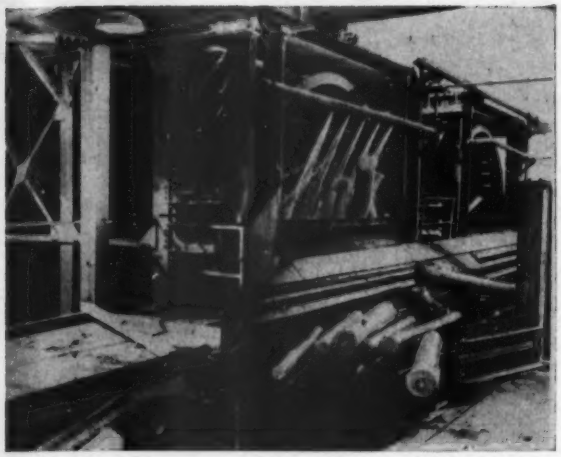
D. B. Kuhe
Vice Pres., Mfg.

W. L. Jones
Gen. Supt.

R. H. Mills
Chief Engineer

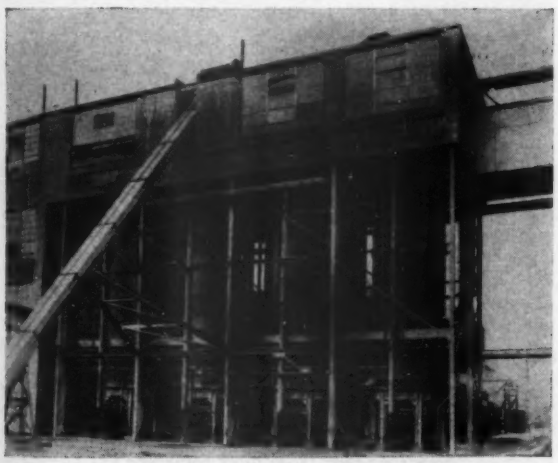
J. R. Leggett
Plant Engineer

W. B. Roberson
Research Director

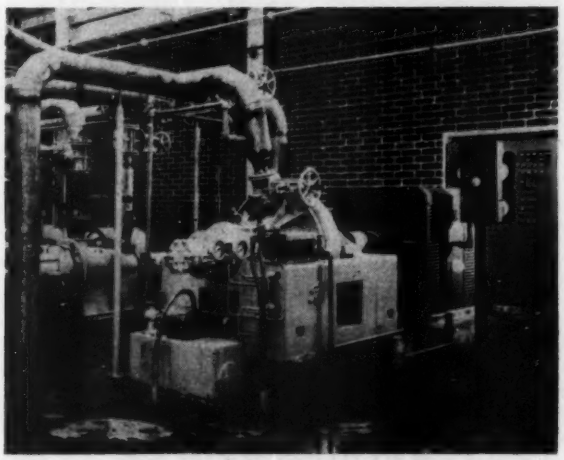


Fibre Making Processes barking drums and B. L. Montague log conveyors.

Stebbins Engineering & Mfg. chip silos and Stephens-Adamson chip conveyors.

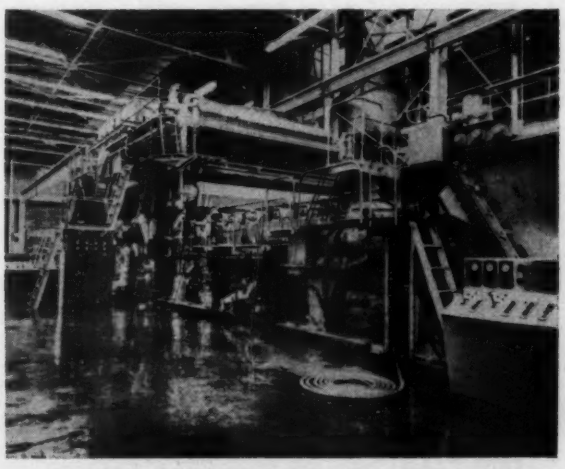


Chicago Bridge & Iron Works Horton-clad digesters.

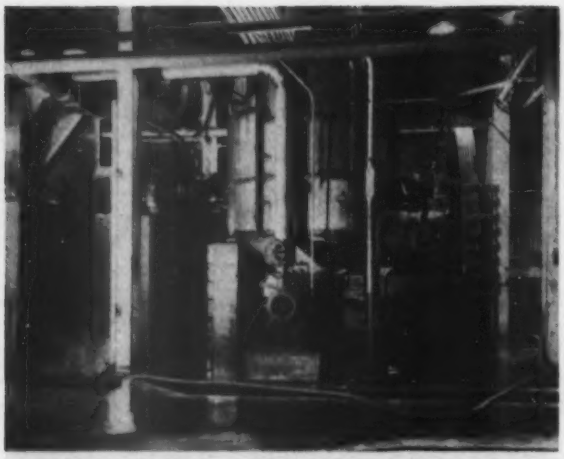


Bauer Bros. No. 442 pump-through refiner.

Sandy Hill Kamyr-type bleach plant washers.



View of the Rice Barton tissue machine.

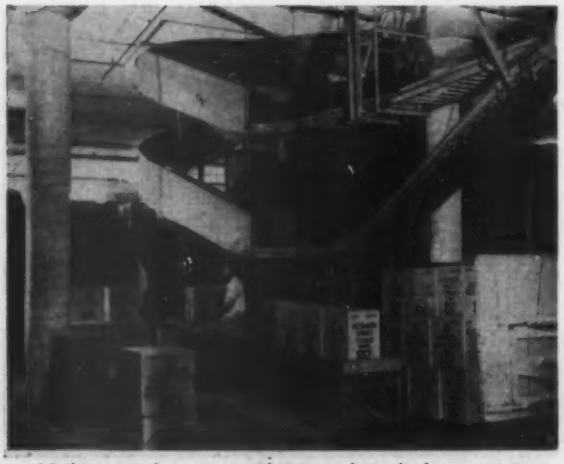


E. D. Jones Hi-Lo pulper defibers either pulp or paper.

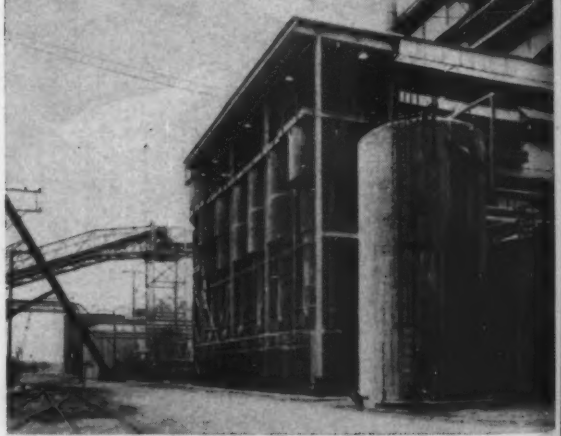
Impco feltless press, SF pulp preheater and SF Flakt dryer.

The pulp web enters the SF Flakt dryer.

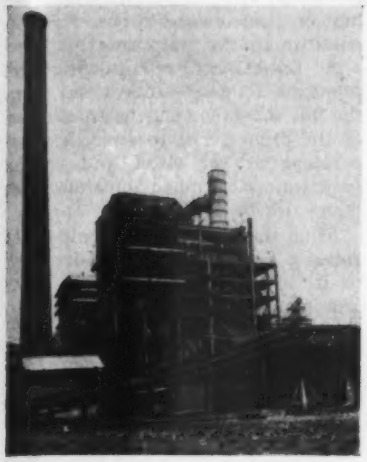
Standard-Knapp facial tissue converting line.



Mathews spiral conveyor with intermediate discharge points.



View of Swenson evaporators.



Babcock & Wilcox recovery furnace and cyclone evaporator.

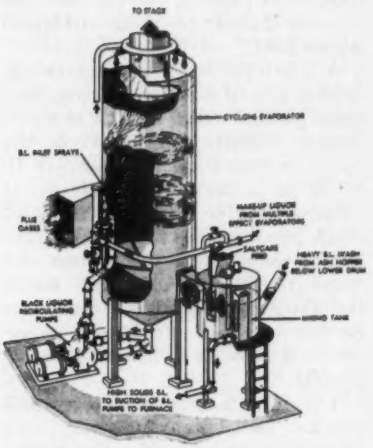
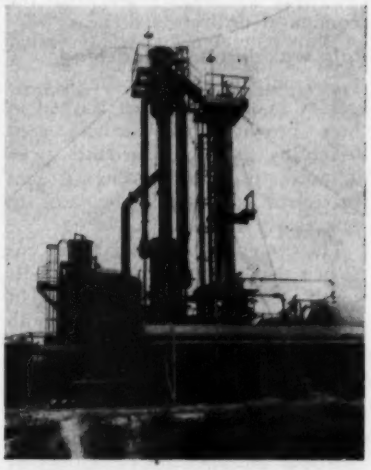
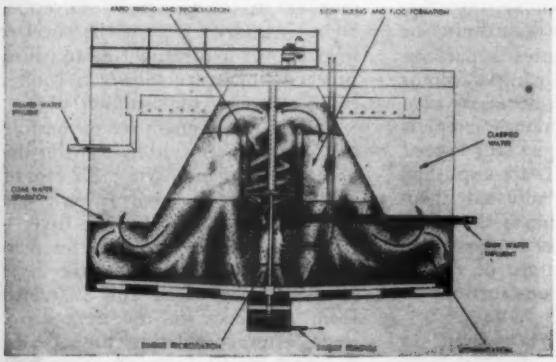


Diagram of the Babcock & Wilcox cyclone evaporator.



Chill-Vactor supplied by Croll-Reynolds.



15,000,000-gal. per day Graver water treatment plant. At the left is a flow diagram of a 3460-gpm Graver reactivator.

tion. The two dry sections are driven by a 150-hp. motor and the wet section by a 100-hp motor. Each drum is provided at the outlet with an air-operated sliding gate.

The barked logs are chipped in a 10-knife chipper and the chips screened in two 5- by 14-ft. type F-600 Ty-Rock vibrating screens.

Chips from sawmill waste are handled by a conveyor system consisting of a tract hopper for either truck or rail unloading, two drag chain conveyors under the hopper and two inclined flight conveyors and belt conveyors supplying the chip screens.

Chips from the screens are conveyed by belt conveyor to three chip bins. From here they are conveyed to the 13 digesters.

Sharp cutting edges of the chipper knives are assured by the use of a Model A K-230-in. knife capacity hydraulic grinder. The grinder features a novel automatic air clamping mechanism which simultaneously grinds a complete complement of ten knives of 21-in. length. The machine further features the Vickers design hydraulic transmission grinding wheel head travel with fingertip control in the range of 10 to 100 fpm. The grinding wheel head motor is of heavy-duty capacity, rated at 15 hp.

Four new digesters

The expanded operation necessitated the addition of four new digesters, bringing the total to 13 digesters. The four new digesters are 12 ft. in diameter and 44 ft. high. They are Hortonclad with Type 316 ELC stainless steel on an A-212-B firebox backing.

The manufacture of Hortonclad is accomplished by a flux-free high-vacuum brazing process producing a clad plate with an integral and continuous bond of high strength. Uniformity of the clad thickness is assured since both alloy cladding and backing are in their final thickness before bonding.

Each digester is equipped with a circulating system, consisting of pumps, heaters, bottom strainers and top spreaders.

A blowheat recovery system, consisting of condenser, accumulator

D. P. Ruby
Tissue Mill Supt.

R. C. Alexander
Tissue Conv. Supt.

J. Langer
Quality Cont. Supv.

and heat exchangers adds to the economical utilization of heat.

Pulp washing and bleaching

The pulp is passed through a vibratory knotter and then washed in three brown stock washers each driven by a 10-hp. variable speed dc motor. From the washers it goes through a consistency regulator to four rotary screens.

The design of these rotary screens is such that each screen draws in its supply from a low inlet head of only a few feet and elevates both the tailings and screened stocks to heights of 4 ft. and 2 ft. respectively. This permits placing the screens adjacent to each other (at the same elevation) and an automatic delivery (without intermediate pumping) of rejects from the first screens to the tailings screens. The tailings screens in turn can receive a certain quantity of fresh pulp and deliver accepted stock to a common distribution header, which also receives the accepted stock from the first screens.

Three of the four screens are used as first screens and one as tailings screen. The accepted stock from the screens goes to the thickener driven by a 10-hp. adjustable dc motor.

The thickener, which is a 8-ft. by 14-ft. valveless decker, is equipped with one shower pipe that provides washing at the rate of 75 gal. of fresh water per minute. Its filter area is 286 sq. ft., and drum speed is 1 revolution every 20-60 seconds. The decker has a capacity of 220 tons of air-dried pulp per day. It thickens the stock from 0.7 per cent to 12 per cent consistency.

From the thickener the pulp goes to the four-stage Kamyr bleach system. The bleach system begins with a chlorination stage and continues through a caustic extraction, hypochlorite and chlorine dioxide stages. The bleach plant has a daily capacity of 200 tons, bleaching to 88-90° pulp brightness.

The circulation pump in the bottom of the upflow chlorination tower is rubber-lined, and the impeller and shaft sleeve are made of 317 stainless steel.

The caustic and hypo towers incorporate the down-flow high-density system, by which the stock is diluted by nozzle sprays near the bottom of the tower and kept in circulation by specially designed agitators. A stainless double-shaft mixer precedes each tower.

The chlorine dioxide tower embodies the latest high-density upflow system in which the chlorine dioxide water is added to the pulp in a radial flow mixer at the base of the tower. All parts in contact with the chlorine dioxide are made of Hastelloy C steel.

A Chill-Vactor, a vacuum refrigeration unit of 50-gpm capacity, provides chilled water for the chlorine dioxide bleach plant. It cools the water in two stages from 82° F to 40° F to increase the solubility of chlorine dioxide. It uses 1800 lbs. of steam per hour and 470 gpm of condenser water. Since this system also automatically deaerates the water, the absence of air from the water further increases the latter's capacity for dissolving additional chlorine dioxide.

The four washers, one of which follows each bleaching stage, are equipped with patented automatically-loaded vacuum breakers and have perforated plate decks with facing wire applied directly over the washer drums. They are driven by four 7½-hp. adjustable speed dc motors.

Each drive constitutes a package type power unit, housing a motor generator set and the necessary control for obtaining smooth, stepless speed control over a 16:1 speed range. Speed control is accomplished through a manually-adjusted rheostat, and load indication is shown by direct current ammeter connected to the unit. All motors are of totally enclosed fan-cooled construction.

Pulp drying

The pulp routed to the pulp dryer is passed through 13 cleaners. Ten No. 623-4 cleaners are in the primary position, two No. 623's in the secondary position and one No. 623 in the tertiary position. Each of the primary cleaners has a capacity of 650 gpm, while the secondaries and tertiary cleaners have a capacity of 500 gpm.

The stock is then pumped to the wet end headbox, thickened in vacuum filters and passed through a feltless wet press. From here it enters the aluminum hood enclosure of the pulp preheater. The preheater is of novel design in that it does not require any live steam but uses the high heat content of the moisture-laden air from the pulp dryer to raise the temperature of the pulp sheet.

The pulp sheet, after entering the hood of the preheater, is turned over turning rolls in a number of vertical passes before leaving the hood again. The hot moist air is blown through special air distributors between the passes against both surfaces of the sheet. Since the air entering from the pulp dryer is saturated with moisture, some condensation of moisture takes place on the sheet. This, however, releases the heat of condensation to raise the temperature of the pulp sheet.

A feltless press following the preheater removes excess water from the hot sheet, so that the total effect of the preheater is to raise the temperature of the sheet and at the same time accomplish some moisture removal.

From the last press the pulp sheet enters a Type H Flakt dryer designed to dry 150 tons of pulp per day from a moisture content of 50 per cent to that of 10 per cent. The dryer is 108 ft. long, 14 ft. wide, and 13½ ft. high. It is well insulated and equipped with full-height doors along both sides for easy access. At both ends are windows and electric hoists to facilitate threading.

The sheet enters the dryer at the bottom and is carried back and forth in nine passes on chain conveyors. At each end of a pass, the sheet is turned over a turning roll and then proceeds in a reverse direction on a chain conveyor on a higher deck.

Specially designed steam heating coils between the decks transfer the necessary heat for drying. Six fans of axial flow type—three at each side of the middle section of the dryer—circulate hot air around the pulp sheet. Preheated air enters the dryer at the bottom deck and is routed from one deck to the next above until, after completing nine passes, it is exhausted from the top deck. The moisture content of the exhaust air is regulated by dampers to give the most economical operation.

The high heat content of the moist exhaust air is utilized for (1) preheating the supply air for the dryer in an air-to-air heat exchanger made of aluminum, (2) generating hot process water in a water heater, and (3), as already mentioned, preheating the pulp sheet in the preheater.

The dried sheet is then cut in a layboy cutter and baled in a 600-ton pulp baling press equipped with a 23.8-gpm pump capable of developing 2850 psi hydraulic pressure. The baling press is controlled by an instrument panel including hydraulic pressure gauges, indicating thermometer, electric timer and various pushbuttons for control.

The bales of pulp are conveyed to an Auto-Wire Twistlock machine, where they are automatically reinforced with four or more wires in crosswise directions. The machine, with a rated capacity of 20-22 straps per minute or 60-65 bales per hour, is equipped with conveyor, turntable and two motors (one 5 hp. and one 1 hp.). To facilitate replacement of

parts, its major wearing portions are unitized, e.g. the main knotter unit which produces the tie and cuts off the wire has been assembled on a single plate which can be removed and replaced with a spare unit in about 4 min.

The pulp dryer is driven by a multi-motor pulp dryer drive equipped with Dancer rheostat regulation.

Stock preparation

Bleached pulp is fed to a No. 442 Pump-Through disc refiner driven by a 300-hp induction motor. The motor is a bracket bearing drip-proof type provided with special sleeve bearings to withstand the momentary occasional end thrust characteristic of the type of refiner used. The important features of the refiner are the location of the rotating disc between the bearings and the arrangement by which the rotating head is pulled, and not pushed against the stationary head.

The stock is pumped to the refiner under pressure and discharged under pressure, the rate of flow being controlled by an ordinary stock valve on the discharge line from the unit.

From the refiner the stock goes to four jordans arranged in parallel. From here it goes to a metering stuff box consisting of a horizontal meter mounted on a stainless steel supply vat. The meter is driven at 10 rpm, or less, by a motor through reduction gearing. The motor is synchronized with the speed of the fourdrinier wire drive roll by means of two tachometer generators, which automatically ties in the discharge of stock from the stuff box with the speed of the paper machine.

The stock then goes to a deculator-cleaner installation, which consists of eight centri-cleaners mounted in an inverted position on the deculator.

From the deculator-cleaner unit stock is pumped through the flow nozzles into the headbox of the tissue machine.

The tissue machine

No. 3 machine, with a 226-in. wide wire, is designed to produce 80 tons of crepe tissue at speeds ranging to a maximum of 2500 fpm.

A 12,500-gpm fan pump pumps the stock into the main line of the stock inlet, where a remote operated control valve throttles the stock flow.

The manifold from the pump to the machine is set at an upward angle and tapered to maintain constant stock velocities in each of the outlet branch manifolds. Precautions are also taken to continuously bleed off the air from the stock entering the headbox, as well as avoid flocculation and stagnation of flow.

The full cantilever type fourdrinier has a 226-in. wide and 67-ft. long wire. The wire is pre-draped in the aisle. A unique feature of this unit is the suction breast roll with its duplex vacuum boxes.

The forming area of the wire is supported by four 20-in. diameter wire-type table rolls and two plain rubber-covered supporting rolls. There are no suction boxes.

A 28-in. diameter pick-up roll is located over a 36-in. diameter grooved wire drive roll of non-suction type. The pick-up felt, 100 ft. long and 230 in. wide, transports the paper to a "Clover-Leaf" press, which has a 48-in. diameter bottom roll equipped with two suction boxes.

The 32-in. diameter plain and rubber-covered first top roll is followed by the 28-in. suction second top roll.

Both the bottom and pick-up felt systems are equipped with standard controls, consisting of motorized stretcher, air-operated guides, wash equipment and wringer rolls.

At the Yankee dryer, which is 12 ft. in diameter and 19 ft. wide, the paper web is deposited on the surface by a suction pressure roll under a pressure of 400 psi.

Automatic temperature control of the Yankee dryer and the condensate removal system feature (1) a temperature-sensing instrument which automatically controls the high-pressure steam supply, (2) a thermo-compressor which provides for the necessary rapid circulation of the heat carrier and (3) differential pressure control which at all times assures efficient condensate removal. Further refinements are "break control" and "Sunday drive" which add to the flexibility of operation.

Provisions are also made for the recovery of heat from the condensate and flash steam. This recovered heat is used to pre-heat water used at the showers. A vacuum extraction system of non-condensables further assures a maximum of heat transfer efficiency.

The Yankee air system is designed for high air velocity made possible by high-volume, high-static fans and a specially designed hood. Exhaust air is removed from the hood by two exhaust fans from two locations.

A Lodding steam-heated creping doctor removes the sheet from the dryer roll giving it the exact amount of crepe. The creped sheet then passes to a pneumatically-operated horizontal reel, where it builds up to a completed roll of 600-in. diameter. Automatic sheet transfer permits roll change at maximum speed without loss of production.

A trim conveying system, consisting of a high-pressure fan, duct work and two adjustable injectors, removes trim from the machine area to the Liebeck pulp disintegrator.

The Liebeck disintegrator consists of a tile chest with a longitudinal shaft mounted near the bottom and carries four large propellers. The pairs of propellers at opposite ends are of opposite hand, and the rotation of the shaft is such that the stock is driven toward the center where it rises with much turbulence and circulates rapidly toward the ends. The disintegrator is equipped with completely automatic control mechanism. The propellers are made of bronze, and the bearings are of the SKF self-aligning type.

A double surface rewind arrangement handles two 60-in. diameter "parent" rolls simultaneously, slitting them and rewinding them into several smaller diameter two-ply rolls.

From the rewinders the two-ply creped sheets pass through two pairs of calender-type draw rolls.

Following these is the size 21 score type slitter which reduces the full width paper to widths and diameters suitable for the conversion department. A push-pull dust system is designed to remove dust from the slitting operation.

The rolls are ejected from the winder apron table to a hydraulic table which lowers them to the floor, or level of a truck, for transportation to the converting room.

The sectional electric drive with amplidyne control permits minute draw adjustments to be made by finger tip control.

Converting area

The converting area is equipped to convert 200-230 tons of tissue paper into various tissue products.

The equipment on toilet tissue includes four rewinders and four wrappers, each capable of wrapping 100 rolls of toilet paper per minute. The whole assembly is served by an automatic conveying system.

There are three No. 2-A napkin folders equipped with No. 4-E triple embossers. The embossers are equipped with three sets of die and mating paper rolls to emboss each web individually with sharp uniform design. The folder handles

Hudson Pulp & Paper's new tissue machine and auxiliary equipment

Chip preparation

Barking drums (2), 12 ft. x 67¼ ft., LM-bar chain-suspended ..... Fibre Making Processes Inc.
Chipper (1), 10-knife ..... Carthage Machine Co.
Chip bins (3) ..... Stebbins Engineering & Mfg. Co.
Chip screens (2), F-600 Ty-Rock vibrating ..... W. S. Tyler Co.
Chip conveying system ..... B. L. Montague Co. Inc.
Chip conveyors ..... Stephens-Adamson Mfg. Co.
Knife grinder (1), Model A K-230-in., equipped with novel automatic air clamping mechanism .. Hanchett Mfg. Co.
Log conveyor, 236 ft. long, 125 fpm, capacity 40 cords pulpwood per hour ..... B. L. Montague Co. Inc.

Digesters

Blowheat recovery system, including condenser, accumulator and heat exchangers ..... Fibre Making Processes Inc.
Digesters (4), 12-ft. diam., 44 ft. high, Hortonclad, with Type 316 ELC stainless steel ..... Chicago Bridge & Iron Co.
Digester circulating systems (4), including pumps, heaters, bottom strainers and top spreaders ..... Fibre Making Processes Inc.

Pulp washing and bleaching

Brown stock washers (3) ..... Improved Machinery Inc.
Caustic and hypo towers, down-flow type, with double-shaft mixers ..... Sandy Hill Iron & Brass Works
Chlorination tower, upflow type, with rubber-line circulation pump ..... Sandy Hill Iron & Brass Works
Chlorine dioxide generating plant ..... Solvay Process Div., Allied Chemical & Dye Corp.
Chlorine dioxide tower, high-density upflow type, with radial flow mixer at the base .. Sandy Hill Iron & Brass Works
Chill-Vactor (1), a vacuum refrigeration unit, 50-gpm capacity ..... Croll-Reynolds Co. Inc.
Consistency regulators (4), for controlling density of washed stock, screened stock and bleached stock ..... Trimbey Machines Inc.
Kamyr bleach system, four-stage: chlorination, caustic extraction, hypo, chlorine dioxide; 200 tons capacity ..... Sandy Hill Iron & Brass Works
Motors (3), 10 hp variable speed dc on brown stock washers ..... Reliance Electric & Eng. Co.
Motors (4), 7½-hp., adjustable speed on pulp washers ..... Reliance Electric & Eng. Co.
Motor (1), 10-hp, adjustable speed dc on thickener ..... Reliance Electric & Eng. Co.
Rotary screens (4) ..... Trimbey Machines Inc.
Thickener (1), 8-ft. by 14-ft. valveless decker, 286-sq. ft. filter area, 220 tons capacity ..... Dorr-Oliver Inc.
Tile chests ..... Stebbins Engineering & Mfg. Co.
Tile linings ..... Stebbins Engineering & Mfg. Co.
Washers (4), Kamyr type for bleach system, equipped with package type power unit drives ..... Sandy Hill Iron & Brass Works

Pulp drying

Auto-wire Twistlock machine, for reinforcing pulp bales ..... C. Tennant Sons & Co.
Baling press (1), 600-ton, equipped with a 23.8-gpm pump, instrument panel and hydraulic pressure gauges ..... Baldwin-Lima-Hamilton Corp.
Cleaners (13), ten No. 623-4 primaries of 650-gpm capacity each; two No. 623 secondaries and one No. 623 tertiary of 500-gpm capacity each ..... Bauer Bros. Co.
Consistency regulator (1), for control of pulp density to pulp dryer chest ..... Trimbey Machines Inc.
Feltless wet presses (2), one located before and the other after the preheater ..... Improved Machinery Inc.
Headbox ..... Improved Machinery Inc.
Pulp dryer, Flakt Type H, 150 tons/day capacity, equipped with chain conveyors, specially designed steam heating coils and axial flow type fans ..... American SF Products Inc.
Pulp dryer drive, multi-motor type with Dancer rheostat regulation ..... Westinghouse Electric Corp.
Pulp preheater, equipped with aluminum hood enclosure and special air distributors .... American SF Products Inc.
Layboy cutter (1) ..... Lamb-Grays Harbor Co. Inc.
Motors ..... Westinghouse Electric Corp.
Tile chests ..... Stebbins Engineering & Mfg. Co.
Vacuum filters ..... Improved Machinery Inc.

Stock preparation

Consistency regulators (2), for control of stock density to paper machine chests ..... Trimbey Machines Inc.
Deculator-Cleaner installation, eight centri-cleaners mounted on a deculator ..... Bauer Bros. Co. and Rotaread Inc.
Disc refiner (1), No. 442 pump-through type, with rotating disc located between bearings, driven by a 300-hp Elliott motor ..... Bauer Bros. Co.
Jordans (4) ..... Noble & Wood Machine Co.
Metering stuff box, with horizontal meter mounted on stainless steel supply vat, motor synchronized with speed of fourdrinier drive roll ..... Trimbey Machines Inc.
Tile chests ..... Stebbins Engineering & Mfg. Co.

Tissue machine

Air compressor (1), 18-11 x 14, 1052 cfm ..... Ingersoll Rand Co.
Air compressor (1), 15-9¼ x 12, 650 cfm ..... Worthington Corp.
Air system on Yankee dryer, with specially designed hood and high-volume, high-static fans ..... J. O. Ross Engineering Corp.
Condensate removal system, automatic .... Ross Midwest Fulton Corp.
Creping doctor, Lodding, steam-heated ..... Rice Barton Corp.
Cranes (3), 5-, 15-, and 20-ton capacity, double I beam ..... Reading Crane & Hoist Corp.
Fan pump (1), 12,500 gpm, with preset speed and flow automatically controlled ..... Warren Pumps Inc.
Dust system, push-pull type ..... J. O. Ross Engineering Corp.
Hi-Lo pulper, two-disk type, disks of stainless steel ..... E. D. Jones & Sons Co.
Paper machine, cantilever type fourdrinier, with 226-in. wire, 2500 fpm, 80 tons/day of tissue capacity, equipped with suction breast roll ..... Rice Barton Corp.
Paper machine drive, sectional electric, with amplidyne control ..... General Electric Co.
Press section, "Clover Leaf" type, with 48-in. diameter suction first bottom press roll and 28-in. diameter suction second top roll ..... Rice Barton Corp.
Pulp disintegrator, Liebeck, with four large propellers and automatic control mechanism ..... E. D. Jones & Sons Co.
Reel, pneumatically-operated horizontal, with automatic sheet transfer ..... Rice Barton Corp.
Rewinder, capable of handling two 60-in. diameter rolls simultaneously ..... Cameron Machine Co.
Slitter (1), size 21 score type ..... Cameron Machine Co.
Stock inlet, of unique design ..... Rice Barton Corp.
Temperature control system on Yankee dryer, automatic ..... Ross Midwest Fulton Corp.
Tile chests ..... Stebbins Engineering & Mfg. Co.
Tile linings ..... Stebbins Engineering & Mfg. Co.
Trim conveying system ..... J. O. Ross Engineering Corp.
Vacuum extraction system of non-condensables ..... Ross Midwest Fulton Corp.
Vacuum pumps ..... Nash Engineering Co.
Yankee dryer, 12-ft. diameter, 19 ft. wide, equipped with suction pressure roll ..... Rice Barton Corp.
Saveall ..... Sveen-Pedersen Sales Corp.

Converting area

Conveying system for handling finished products, including gravity roller conveyors, belt-driven line roller conveyors, single and double deck belt conveyors, deflectors, ball transfer tables, telescoping wheel conveyors, etc. ..... Mathews Conveyor Co.
Compression units (2) ..... Standard-Knapp Div., Emhart Mfg. Co.
Facial tissue packer, Model 806 adjustable, equipped with 33-ft. conveyor ..... Standard-Knapp Div., Emhart Mfg. Co.
Gluers (2), top and bottom, with lift belt

timer, roller bed platten .... Standard-Knapp Div., Emhart Mfg. Co.
Hankie packer, Model 806, non-adjustable ..... Standard-Knapp Div., Emhart Mfg. Co.
Napkin-folders (3), No. 2-A, equipped with No. 4-E triple embossers ..... Hudson Sharp Machine Co.
Packers (2), special tail end ..... Standard-Knapp Div., Emhart Mfg. Co.
Rewinders (4), on toilet tissue, with automatic conveying system ..... Hudson Sharp Machine Co.
Wrappers (4), on toilet tissue, 100 rolls/minute each ..... Hudson Sharp Machine Co.

Water treatment plant

Airveyor system, for handling clay ..... Fuller Co.
Blower, 14 x 21 Type RCR, rotary positive displacement ..... Roots-Connersville Blower Corp.
Chemical feeders ..... Graver Water Conditioning Co.
Chlorinators (2), air-operated. Master type ..... Graver Water Conditioning Co.
Filters (8), 16 x 30-ft. gravity type .... Graver Water Conditioning Co.
Filter operating tables (8), completely equipped with control instruments ..... Graver Water Conditioning Co.
Pumps (3), supplying water to the mills, driven by Westinghouse motors ..... Ingersoll-Rand Co.
Water softeners (3), 90-in. diam., 16 ft. high, resin zeolite type, with semi-automatic regeneration system ..... Graver Water Conditioning Co.
Water treatment plant, 15,000,000 gal/day capacity, including three 80-ft. diam. x 19 ft. high reactivators .... Graver Water Conditioning Co.
Water pipe, 2 miles long, 30-in. diam., supplies water to Graver system ..... Armco Drainage & Metal Products Inc.

Steam and power supply

Air preheater, tubular type ..... ABCO Furnaces
Airveyor system, for salt cake handling, 10 ton/hour capacity ..... Fuller Co.
Ash and fly ash conveyor ..... United Conveyor Corp.
Bark burning boiler (1), 70,000 lbs. steam/hour capacity, 500 psi ..... Wickes Boiler Co.
Bark bin feeders (2), variable speed and live screw bottoms ..... ABCO Furnaces
Blower, 14 x 21 type RCR, rotary positive displacement ..... Roots-Connersville Blower Corp.
Cyclone evaporator, for concentrating black liquor prior to burning in the recovery furnace .... Babcock & Wilcox Co.
Forced draft hearth furnace, on bark-burning boiler ..... ABCO Furnaces
Control centers, low voltage, plug-in type units ..... Westinghouse Electric Corp.
Precipitator, electrostatic, double chamber, equipped with motor-operated slide gates ..... Koppers Co. Inc.
Recovery furnace, 126,000 lbs. steam/hour, 460 psi ..... Babcock & Wilcox Co.
Switchgear, in power house, 5000 volts, with draw-out type air circuit breakers ..... Westinghouse Electric Corp.
Turbine generator, 6,250 kw, non-condensing, for automatic steam extraction at 150 psi ..... Westinghouse Electric Corp.
Turbo-mixer, salt cake precipitation tank mixer ..... Turbo-Mixer

General equipment

Piping and engineering of piping installation ..... Grinnell Co. Inc.
Pumps (50), bleach plant, black liquor, white water, general service ..... Goulds Pumps Inc.
Pumps (24), stock preparation, bleach plant, tissue machine ..... Warren Pumps Inc.
Pumps (19), centrifugal ..... Worthington Corp.
Motors ..... Westinghouse Electric Corp., Elliott Co., Reliance Electric & Eng. Co.

three separate webs of paper, discharging the finished napkins on three separate decks. Each machine is capable of folding 1500-2000 napkins per minute.

A Model 806 non-adjustable packer packs 9 x 2 x 4 packages at the rate of 250 hankie packs per minute.

Facial tissue is packed in a Model 806 adjustable packer at the rate of four cases per minute. A 33-ft. conveyor is used in conjunction with this packer.

An elaborate conveying system handles the cases of (1) toilet tissue, (2) hankies, (3) satin finished napkins and (4) facial tissue. Six different sizes of cartons are handled on this system from the packing area on the second floor, through gluing and compression units, to the shipping and storage areas.

The conveying equipment consists of a carefully engineered system of gravity roller conveyors, belt-driven line roller conveyors, single- and double-deck inclined and level belt conveyors, switches, deflectors, ball transfer tables, telescoping wheel conveyors, etc.

One of the most noteworthy points in this system is the double-bladed sheet metal spiral conveyor, with intermediate discharge points to belt conveyors which in turn discharge to a long belt conveyor on the storage dock for loading into railroad cars. The spiral conveyor also lowers cartons directly to the palletizing and storage areas.

Water treatment plant

The 15,000,000-gal. per day water treatment plant, includes three 80-ft. diameter by 19-ft. high reactivators, each capable of processing 3460 gpm of water. Flocculation is effected with alum, using clay as a weighting agent. The equipment further includes two air-operated Master chlorinators and chemical feeders, as well as the necessary control instruments.

Following the reactivators there are eight 16- by 30-ft. gravity filters completely equipped with controls (there are eight filter operating tables), sand and gravel.

Three service pumps supply water to the mill.

Boiler feedwater is treated in three 90-in. diameter by 16-ft. high resin zeolite water softeners, featuring a semi-automatic regeneration system.

The clay needed for the water treatment plant is handled by a clay Airveyor system which unloads air-floated clay from box cars and delivers it to the storage bin at the rate of 8-10 tons per hour. From the storage bin the clay is delivered to the clay feeder. A size 14 x 21 Type RCR rotary positive displacement blower supplies air to the clay Airveyor system.

Steam and power supply

Additional steam supply for the new expansion is provided by a new bark-burning boiler generating 70,000 lb. of steam per hour. The boiler contains 8744 sq. ft. of effective heating surface and is designed for a working pressure of 500 psi and a temperature of 725° F at the superheater outlet.

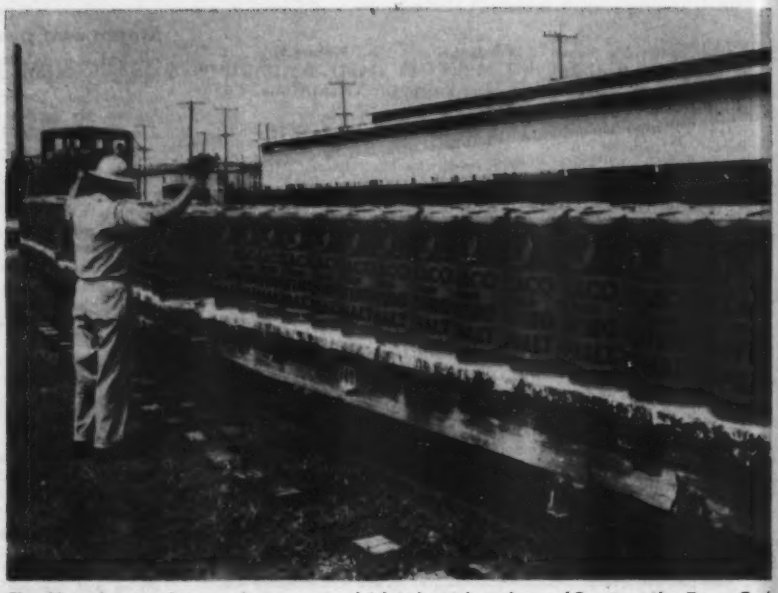
The unit is so designed as to make the furnace an integral part of the steam generator. The furnace is a forced draft hearth type, featuring a long cross hearth, approximately 10 ft. wide and 18 ft. long. The combustion chamber floor consists of cast iron grates over a shallow ash pit. A motor-driven forced draft fan supplies atmospheric air into the ash pit and through the grates. The air supply, which almost entirely controls the combustion, is manually controlled by the operator. Over-all operating efficiency of the unit is increased by the installation of a tubular type air preheater.

The combustion air in the preheater is heated to about 375° F and is introduced into the furnace through tuyeres, formed by 2¼-in. by 2½-in. openings between the

(Continued on page 256)

The impact of packaging on the paper industry

JOHN B. CALKIN and JOHN L. PARSONS
Calkin & Bayley Inc.
New York, N. Y.



The fiber drum and paper bag are standard industrial packages (Courtesy the Texas Co.)

Part II — Paper packages; industrial packaging; molded fibrous containers; packaging and selling aids.

THE STORY of the contribution of the packaging industry to the paper and allied industries is a thrilling one. It is a story of growth by an interchange of adaptability and ideas. The future is in the making and is a real challenge to all who are associated with the task of planning and looking at the horizon of things to come.

Paper packages

The folding box is probably the largest and most widely used form of packaging at the present time. This type of box has demonstrated its value as a protective container and in the present self-service age has increased in importance as a silent but effective salesman for the product contained therein. The tremendous production of paperboard in 1955 reflects the expansion of the packaging industry to giant size at the present time.

The steps in paper box manufacture involve the designer, the printer, the die maker and the machinery for producing the box, as well as the paper manufacturer.

The set-up paper box industry in 1955 exceeded the sales volume of any previous year. While there has been no end-use classification breakdown for this industry, the emphasis has been placed on pre-packaging by department and specialty stores. The demand for better point-of-sale boxes for cosmetics, confectionery items and writing instruments has resulted in the increase in consumption of set-up boxes.

The all-paper can and composite paper can with metal ends offer substantial economies over the all-metal package. Recently there has been renewed interest on the part of large packagers of consumer or shelf items to reduce packaging costs, which are increasing in most distributing industries. When packaging costs become too high, consumers turn to the paper converting industry for service and savings.

The newly-developed merchandising techniques of the self-service supermarket have resulted in increased usage of paper containers to withstand liquids. The advantages of this lightweight package for dairy products, fruit juices, and frozen foods have been quickly appreciated by both processors and consumers. Recent improvements include easy-opening tabs, non-spill reclosable pouring vents, window lids and so forth. Some containers are designed to withstand oven heat in order that the contents may be warmed before serving.

During the past 10 years the paper milk bottle has captured almost all the wholesale distribution of milk. With the increase in the number of deep-freeze units in the home, the packaging of ice cream has changed in emphasis. A popular package of ice cream for the home now is the ½-gal. paper container.

One advantage to flexible packaging is that the paper bag can be adapted to the product to be packaged. Bags of various dimensions can be made of almost any grade of paper, which can be treated in various ways for protective purposes. Developments in bag manufacturing and in packaging techniques, together with the availability of

barrier coatings and other features, have made it possible for a flexible package to have the following properties: wet-strength, retardation of rancidity, grease resistance, retention of flavors and aromas, moisture resistance, resistance to heat and cold, protection against light, elimination of sifting and minimization of breakage. An added advantage is the minimum storage space for empty containers.

Industrial packaging

The constant effort to lower packaging costs is translated into a never-ending search for more economical types and arrangements of materials and containers in the industrial and shipping-packaging field. The multi-wall paper bag and the fiber drum are standard packages for dry, free-flowing industrial products. Paper bags are now available in large sizes for the packaging of mattresses, furniture and even automobiles. Flexible paper wraps have been developed for the outside storage of lumber, thus reducing the need for covered storage sheds in wholesale and retail yards. A new banana box, made of special weather-proof fiberboard, weighs one-third as much as wood or metal boxes and costs one-third as much as wood and one-fifth as much as metal containers.

In the food industry, paperboard-plastic combinations are finding increased use in shipping fresh fruit and vegetables to distributors. Nearly 80 per cent of the lettuce crop is shipped in paperboard with less loss of the product. Diphenyl anti-mold treatment has been applied to corrugated "half boxes" for moving about 80 per cent of the lemon crop, and the same percentage of the grapefruit harvest travels in paperboard.

Many types of household furnishings, including TV sets, rugs and refrigerators, are shipped in attractively-printed corrugated containers. Corrugated containers are replacing wooden kegs for nails, nuts and bolts. Industrial packaging today is alive with new challenges and opportunities as the result of changing concepts and more knowledge. The biggest force in industrial packaging is the development of new materials and new ways of using old materials.

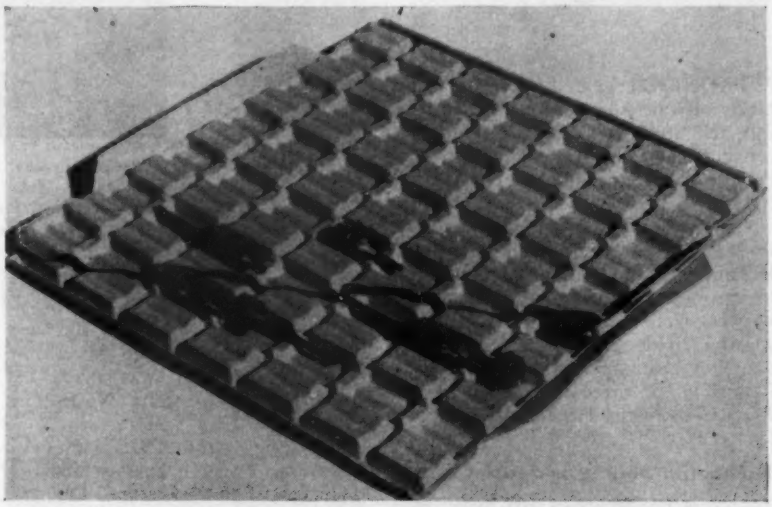
A simple coating on kraft paper has led to the development of a VPI (vapor phase inhibitor) packaging suitable for wrappings, bags, envelopes, drum liners, carton liners, impregnated wadding, cushioning pads and other materials. Long term corrosion prevention of iron parts is thus possible without the application of grease when paper for packaging is treated with VPI chemicals.

Paper and cellulose wadding for cushioning have played conspicuous roles in packaging fragile products, such as electronic tubes, in this age of instrumentation. Other speciality packaging, not normally encountered or required in industry, is specified by military contracts.

Molded fibrous containers

The manufacturer of most types of merchandise is constantly trying to reduce costs while maintaining high quality. One of the most important considerations, and sometimes very ex-

(Continued on page 225)



Molded pulp gives maximum protection (Courtesy Keyes Fibre Co.)

A good label is the most powerful salesman (Courtesy Riegel Paper Corp.)

Superintendents stage 38th annual meeting in Chicago

APPMSA division chairmen: J. Jenkins, Northwest Paper Co.; Marshall H. Rutz, KVP Co.; Mason Hinkle, the Mead Corp.; Walter S. Dempsey, H. Waterbury & Sons Co.; John H. Rich, Riegel Paper Corp., and Albert E. Bachmann, president and general manager of Missisquoi Corp. and 1957-58 president of APPMSA.

A PROGRAM geared to meet the needs of operating executives. That was the story of the 38th annual convention of the American Pulp & Paper Mill Superintendents Association.

The psychology of persuasion as well as recent developments in the technique of modern sulfite digester linings were discussed by men and women well qualified in their respective fields. Hardly an aspect of efficient mill operation was overlooked in the three-day session held May 21-23 at the Hotel Congress in Chicago.

Bachmann new president

Elected president of the Association for the 1957-58 year was Albert E. Bachmann, president and general manager of Missisquoi Corp. in Sheldon Springs, Vt. He succeeds Martin J. Auchter, vice president in charge of manufacturing for Charmin Paper Products Co., Green Bay, Wis.

In his annual message to the convention, Auchter noted the membership problem faced by the Association. "Our membership in the past few years," he said, "has not reflected satisfactory growth. While many new members were accepted (the records show 144 accepted in the past year and 19 currently in process for a total of 163), a total of 138 members were lost through death, resignation or were dropped from our roster as dead timber. So, the net gain was only 25 members. This accomplishment, which parallels that of recent years, clearly indicates that each and every division must sponsor an active membership drive."

Bemis Wood elected

Bemis P. Wood was named fifth vice president of the Association at the annual business meeting. He is assistant to the vice president in charge of production for Strathmore Paper Co. in West Springfield, Mass.

The same session saw the announcement of the winners in the 1957 Bolton Award Contest, the subject of which was, "My Responsibility to the Others in My Company". The report was made by Haigh Reiniger of John W. Bolton & Sons Inc.

First prize winner was James V. Robertson, research chemist for the Mead Corp. at Chillicothe, Ohio.

Second and third awards went to: Miss Virginia Blakemore, secretary to the manager in charge of industrial and community relations at the Champion Paper & Fibre Co. in Pasadena, Texas; and Miss Ellen Arnold, secretary to the plant engineer for Congoleum-Nairn Inc. at Cedarhurst, Md.

Named a trustee at the 38th annual convention of the American Pulp & Paper Mill Superintendents Association was Gordon Singletary of Brunswick Pulp & Paper Co. in Brunswick, Ga. He will serve out the unexpired term of the late William Brydges.

Dickson heads affiliates

Elected to head the Industrial Affiliates for the coming year was John D. Dickson Jr. of Stowe-Woodward Inc. He succeeds Milton M. Bixby of Hercules Powder Co. in Wilmington, Del.

The new first vice chairman is James E. Smith of Albany Felt Co.

The eight firms that became affiliates of the Superintendents Association during the past year were:

American Mfg. Co. Inc., Tacoma, Wash.; Appleton Woolen Mills, Appleton, Wis.; Bulkley, Dunton Processes Inc., New York, N. Y.; Derrico-Canastota Co., Bronx, N. Y.; Gillies Western Corp., Portland, Ore.; Niagara Wire Weaving Co. Ltd., Niagara Falls, Ont.; Rosenblad Corp., New York, N. Y., and Scapa Dryers Inc., Waycross, Ga.

Converting machinery requirements

In a paper entitled "Converting Light Weight Papers and Tissues", R. E. Small of Paper Converting Machine Co. discussed certain guide posts that are helpful in arriving at a mill's converting machinery requirements.

An interesting fact was brought out by the speaker to show that, while the cost of equipment has increased in recent years, in many cases the capital investment for a given unit of production has actually decreased. To prove this point, Small referred to the investment of $1,000 per case of hourly production on roll toilet tissue required 10 years ago. Today, due to the use of the automatic rewinder, this figure has decreased to $800 per case of hourly production.

Discussing another guide post in considering equipment requirements, Small pointed out that while wage rates are generally higher the number of operators required are fewer. Futhermore, neither skill nor initiative on the part of the operators is as important today as it used to be. On the other hand, more highly trained personnel is required now for the mechanical supervision and maintenance of the machines.

Among the modern converting machines discussed by Small were: (1) the driven unwind stand, which

Harry Weston, secretary-treasurer of APPMSA, and R. L. Siegel, vice president of industrial and public relations, Gardner Board & Carton Co.

A. A. Hentschel, formerly of Flintkote Co., and H. E. Wehr of the Mead Corp., first vice president of APPMSA.

H. D. Johnston, Strathmore Paper Co.; Bemis P. Wood, also of Strathmore and fifth vice president of APPMSA, and M. E. Giddings, U. S. Rubber Co.

Ralph K. Nelson, Nu Wood superintendent, Wood Conversion Co., Cloquet, Minn.

R. B. Morden, president of Morden Machines Co., meets friends on the registration floor.

D. B. Chapman, Morden Machines Co., and Carlton Clark of Clark & Vicario Corp.

J. B. Beck, technical director of East Texas Pulp & Paper Co.

R. McKay, Holyoke Wire Cloth Co., and G. Renegar, mill manager for Container Corp. of America.

H. D. Jones, H. D. Jones Co.; H. Chow, Manhattan Rubber Mfg. Co., and A. W. J. Dyck, The PAPER INDUSTRY.

incorporates a series of driven belts to contact the parent roll; (2) the pivoting arm arrangements of the backstand, which allows one person to change large-diameter parent rolls on the rewinder in about 1 min.; (3) the shear cut perforation system, which replaces the serrated knife perforators used for many years in the industry; (4) the development of log cutters after rewinding, which has resulted in improved end appearance, lower sensitivity to web variation on the rewinder, better possibilities for automation of rewinder lines and simplification of the rewinder by eliminating slitters and core cutters, and (5) the development of high-speed wrappers, which permit multiple roll packaging.

Some practical aspects of supercalendering

Discussing the effect of paper machine defects on supercalendering operations, J. Hyatt, J. Berard and P. Miller of Rhinelander Paper Co. pointed out that supercalendering does not eliminate or mask paper machine defects but rather magnifies or alters them in such a way as to cause trouble in subsequent operations.

Defects in paper are a problem of major importance in supercalendering operations. Their effect on

the operation and final quality of the sheet is very costly in lost production and paper losses. Even if the defect in the paper does not cause a web break during supercalendering, the undetected defect which remains in the sheet might cost lost production in conversion or printing operations.

Operating difficulties of cylinder machines

Discussing operating difficulties of cylinder machines, Charles L. Peckham of Container Corp. of America drew attention to a number of problems that have to be overcome by the papermaker.

Dirt that is found in the cheap filler grade of waste paper is one of the problems, and here foreign materials which are lighter than water —such as wax, tar and latex type material—give the most trouble. Also, tin foil has become quite a nuisance.

The major problems with pulp liner unfolding grades are those of proper stock treatment for excellent bending properties and good blending of the colors and chemicals.

In the under-liner and bottom liner systems dirt removal is a major problem.

Stock changes are the largest cause for lost time in the mill, because time is required to clean up the chests, pipelines, screens and vats.

On the wet end the major problems are those of water removal, sheet formation and felt problems, such as felt hair shedding, filling up, felt marking and short life.

The problems at the dry end include the many dry end breaks caused by slime spots, blows and crushing, and tight draws.

Radio and the pulp and paper industry

The benefits of a radio communications system in the pulp and paper industry were discussed by D. C. Cotton Jr. of Union Bag-Camp Paper Corp. This radio communications system has been in effect at the Franklin, Va. operation for nine years. Radio communications are quick and accurate—much quicker than the telephone. It keeps the Franklin mill management in constant touch with battery trucks, cranes, locomotives or tug boats that cannot be reached by any other kind of communications. Management is convinced that the initial cost of the radio equipment as well as the maintenance cost have more than repaid the company in the form of various benefits.

Warehouse handling of paper

Warehouse handling of paper with gasoline-powered lift trucks equipped with rotating roll clamp and a Bartel device was discussed by W. E. Crotty of the Chicago warehouse of Time Inc.

All paper in the warehouse is stored on end in units by mill, grade, size, basis weight, month of manufacture, and by paper machine when a supplier furnishes paper from more than one machine.

The entire warehouse is divided into numbered bays which vary in width from 30 to 70 ft. and from 25 to 75 ft. in depth. The inventory records show the location of each unit of paper by bay number.

There are two main trucking aisles which are 16 ft. wide, thus permitting entry of highway trucks for unloading and loading at the approximate location of the paper to be shipped or stored. Cross aisles are 14 ft. wide to allow sufficient turning radius for the high-lift trucks.

It was announced during the convention that the 1958 session will be held June 3-5 at the Hotel Statler in Boston.

Engineering requirements of paper mills

Roderick O'Donoghue of Roderick O' Donoghue & Co. discussed the engineering requirements of paper mills and their associated pulp mills and converting plants.

The duties of the plant engineer are to: (1) keep a close check on equipment to forestall shut-downs and make the necessary repairs during the shut-downs; (2) keep individual records of each piece of equipment and maintain the cost of each so that inefficient equipment may be eliminated; (3) plan process improvements; (4) keep mill records and record drawings and equipment lists in an up-to-date condition. The plant engineer should be a graduate engineer with a good knowledge of mechanics, steam and electricity. He must be a good organizer and administrator. He must provide the purchasing department with specifications of materials and equipment. In carrying out these functions he will require the assistance of one or more engineers or draftsmen.

The chief engineer must have broad experience in pulp and paper processes, the equipment used in these processes, and in the design of structures to house them. His staff would include engineers who are able to handle the different work classifications called for—such as building design, equipment layouts, conveyors, piping, instrumentation, steam and electricity. The chief engineer's responsibility should be that of estimating the cost of such projects and to advise on economics. He should also assist in the preparation of yearly budgets demanded by the company for maintenance and expansion.

The function of the consulting engineer is that of supplementing the work of the mill organization, or to implement a specific job or an expansion of specialized nature, or assist in reviewing plans in an unbiased manner.

Community relations

A never-ending task—no matter how well and efficiently it is approached—is that of community relations, according to Henry D. Johnston of Strathmore Paper Co.

Addressing the general session on Community and Employee Relations, Johnston noted that the pulp and paper industry is presently doing a good job in getting its "message" to the general public. But, more can always be accomplished.

Praising the American Paper & Pulp Association's program in community relations, the speaker suggested that more firms should take advantage of the APPA's offer of assistance in planning and putting into operation an efficient project aimed at good neighborliness.

In describing the methods that are available to the industry, Johnston declared that—especially in a small town—employees are a good source of public opinion. Therefore, he advised to: (1) tell the story to the worker through house organs, bulletin boards and letters from the management; (2) cooperate with the schools through such tools as APPA booklets; (3) work with the churches; (4) support youth organizations and community activities, and (5) establish good press relations.

Encouraging employee participation in company activities and in solving company problems was stressed as vital to company welfare by R. T. Greep of S. D. Warren Co.

In a talk, "Our Employee Suggestion System—its History and Accomplishments", Greep advised that an employee must be encouraged to use his initiative.

(Continued on page 237)

Choosing the right conduit for pulp and paper mills

V. S. OAKES
Electrical Engineer
Hammermill Paper Co.

Specifying practices based entirely on low initial cost are outmoded because they are usually more expensive in the end.

UNUSUAL CHEMICAL conditions prevailing in the pulp and paper industry pose a special challenge to engineers who specify for electrical services.

Although the price of conduit used in a particular installation may be less than 1 per cent of the over-all total, the true evaluation is determined by the long-range dependability of the material. Expense of installation and expected frequency of maintenance are major influencing factors in the proper selection of conduit used in pulp and paper processing plants.

Specifying policies based exclusively on "low first cost" are as outmoded as they are expensive.

The early failure, for example, of ordinary black enamel conduit when exposed to the corrosive environment of pulp and paper mill operations constitutes a definite hazard and creates a costly maintenance problem. Sound engineering, on the other hand, "adapts the conduit to the job" to avoid such circumstances.

Manufacturers are contributing to improved engineering with new conduits and new methods for protecting presently accepted materials.

The product marketed as Superduct is an excellent example of what has been accomplished by the manufacturer in providing long-term protection for electrical conduit installations exposed to severe corrosive conditions.

A combination Sherardized conduit with an enamel coating of vinyl chloride acetate copolymer Superduct is used extensively at Hammermill Paper Co. It is highly resistant to practically all chemicals and is extremely tough and flexible.

Selecting the conduit

Selection of conduit at Hammermill is based on the degree that available materials measure up to the general requirements of any electrical installation and to the more specific demands of the pulp and paper industry.

Generally, requirements include:

1. The conduit must be noninflammable — that is, the material used, or any protective covering, must not support combustion.
2. It must be rigid — have inherent strength and be reasonably self supporting.
3. It must offer long-life potential,
4. Provide a smooth inner surface for pulling wires,
5. Be relatively inexpensive,
6. Be as light as possible.
7. Offer a minimum resistance to hand-bending in the smaller sizes.

In our industry, conduit is frequently used in concealed locations where evidence of serious corrosion is seldom apparent until trouble with the electrical system develops. Conduit material must therefore be able to resist the prevailing corrosive conditions with a minimum of periodic painting and maintenance. Corrosive-resistance properties should not be affected by nicks, scratches and mechanical damage inflicted on the conduit during normal handling and installation.

Records and test-board data compiled by our engineering department at Hammermill provide a modern approach to engineering economy in the selection of electrical conduit for a particular installation. Our information permits us to scale available conduit materials against the known requirements and provides a logical basis for comparison under actual operating conditions.

Practical testing

The test-board technique is especially useful in determining the validity of claims made by various manufacturers regarding the merits of their products. It can be set up in any plant with a minimum of effort and over a period of time reveals how well each material stands up to chemical conditions peculiar to the plant area.

Since moisture, acid and other corrosive elements vary from plant to plant, the individual electrical engineer must determine the materials he wishes to check and then decide in which plant area the test board should be installed.

At Hammermill our test board has been mounted in the sulfite mill since September, 1955. It is subjected to corrosive fumes in that area. Atmospheric conditions to which the specimens are exposed include: acids of sulfur (principally sulfurous acids), organic acids and chlorine from nearby bleach settling tanks.

Attached to our test board are five different types of conduit. They include: (1) Black enamel, (2) hot dipped galvanized, (3) metallized-galvanized, (4) aluminum and (5) Superduct-Sherardized conduit with an extra coating of acid-resistant enamel.

The types of electrical conduits available in all sizes and in general use today are analyzed here against a background of initial cost. The accompanying table provides a comparative picture of relative costs of each conduit as it is discussed separately.

For purposes of comprehensive presentation the cost of black enamel conduit is arbitrarily established at 100 per cent, with the other conduits scaled to that "norm."

Conduit evaluation

Black Enamel. This grade of conduit produced by the electrical manufacturers continues to be a serviceable product when installed under non-corrosive conditions and maintained by periodic painting. A single paint system does not assure

adequate protection at pores and at the spots where the paint film is disrupted.

Even though the formulation and application of this baked enamel provides a tough, resilient and continuous paint film, the service life of a conduit application is far too severe. Through the shipping, handling, threading, bending and installation phases, numerous scars are left in the paint film. Unprotected steel areas start to rust almost immediately, and the progressing corrosion travels underneath the coating until the entire surface is rusted.

If — as in some pulp and paper mills — black enamel conduit is installed in concrete slabs, the exposed risers in corrosive areas should be a higher quality conduit.

At Hammermill black enamel conduit is seldom used — then only in auxiliary manufacturing areas where no corrosive conditions exist.

Hot Dipped Galvanized Conduits. The hot dipped process is performed by immersing a pipe in molten zinc metal and removing the excess metal from the interior by blowing it out with super-heated steam. This conduit is usually supplied with a baked-on lacquer finish inside and outside of the conduit. The lacquer finish tends to provide a slick inner surface for the fishing of wires and helps minimize flaking of the outer surface when the conduit is bent.

However, hot dipped conduit has historically a high bending resistance due to operations apparently associated with the process. Due to the tendency of the molten zinc to "fill-in" the threads, the conduit must be threaded after the galvanizing process. This vital area of the conduit is therefore left unprotected. Hot dipped galvanized conduit costs 17 per cent more than black enamel conduit.

Metallized-Galvanized Conduits. The exterior of this conduit is galvanized with pure zinc powder. Metallizing is performed with specially designed guns, which supply the necessary force and heat to apply a tight, uniform coating. The metallizing operation eliminates cleansing and straightening operations necessary with the hot dipped process and therefore produces an easier bending conduit. An organic coating applied — by spray — to the interior provides the slick inner surface necessary for easy wire pulling. The exterior is similarly sprayed to provide added protection against conditions detrimental to the zinc coating.

Metallized-galvanized conduit sells for approximately the same as the hot-dipped product and has relatively fewer shortcomings.

Sherardized Conduits. This conduit is produced in an air-tight, sealed retort in which is placed the steel conduit and a specific amount of commercially pure zinc dust. The retort is placed on a mechanism that slowly revolves the retort and distributes the zinc dust over the entire exposed interior and exterior surfaces of the conduit. This process is conducted at a temperature of slightly above 800°F. The coating produced by Sherardizing is formed by the zinc alloying with the steel base metal.

After the initial alloying, subsequent layers of zinc penetrates the coating, increasing its protective thickness. The process establishes a rust-proofing that is an integral part of the product. It cannot be removed except by chemical or mechanical means, which will also partially remove the base metal as well. The outer layer neither cracks nor peels off when bent. The slow heating and cooling during the process tends to normalize the tubing, giving it excellent ductile qualities for bending. Threads are cut on the conduit before it is Sherardized, thus giving protection to the exposed threads comparable to the rest of the conduit. Further protection is provided by a baked-on enamel finish applied to the conduit.

The cost of this conduit is in line with both hot dipped and metallized-galvanized conduits.

Superduct Conduit. This is a high-quality Sherardized steel conduit, designed for long service life under severe conditions. Added corrosion resistance is provided by the baked-on vinyl chloride-acetate copolymer enamel — a strongly adhesive and highly flexible protective coating that withstands extreme abrasions and reasonably high temperatures. Easily bent, formed and field-threaded, Superduct has a smooth inside surface to facilitate "fishing" of wires.

At Hammermill, Superduct is installed in our new neutracel plant, where it is exposed to sulfur dioxide, gas and water vapor. In our bleach plant it is subject to attack by corrosive bleaching agents and water vapor, and in our modern sulfur melting building it is exposed to sulfur dust.

At a nominal cost when compared with conventional zinc-protected conduit — only 29 per cent more than black enamel — it is, in the author's opinion, an excellent choice for general purpose applications as well as severe ones.

Relative Cost for Various Types of Conduit

Fiber	43	per cent
Black enamel	100	" "
Hot Dipped Galvanized	117	" "
Metallized Galvanized	117	" "
Sherardized	117	" "
Superduct	129	" "
Plastic Coated	188	" "
Aluminum	197	" "
Rigid Plastic	314	" "
Copper-Silicon	844	" "

Other (zinc-coated) Conduits. Some or all of the zinc-coated conduits may be offered with additional protection provided by acid-resistant enamel or jacekts of polyvinyl chloride or polyethylene. In the case of plastic-jacketed conduits, standard plastic electrician's tape may be used to provide a continuity of protection at couplings. Although this system may require an additional amount of labor to install, properly installed it should provide a high degree of chemical and mechanical protection for the conduits. This conduit costs 88 per cent more than black enamel.

Copper-Silicon Alloy Conduits. A top-quality conduit is made from high strength copper-silicon alloy and has excellent corrosion resistance. Where there are high concentrations of acid fumes and in certain concealed locations, the added cost of copper-silicon alloy conduits may be a very sound investment.

Copper-silicon alloy conduits compare favorably in bending and threading ease with steel conduits. Its weight is approximately 20 per cent more than steel conduits, but this alone should not be a large negative factor.

However, it has found limited acceptance in the pulp and paper industry because of its relatively high cost. Its cost is approximately 8½ times as much as standard black enamel conduits.

At Hammermill, we have no experience with this conduit and only mention it because it is available on the market.

Aluminum Conduits. Aluminum has some very desirable features: lightweight, resistance to many

chemicals and high strength. First cost, however, is approximately twice that of black enamel conduits. Although it should be satisfactory in locations where sulfuric or sulfurous acids are prevalent, a protected steel conduit may be just as effective and considerably cheaper.

Severe corrosion results when aluminum is exposed to mixtures of chlorine and water.

Aluminum has been used in concrete slabs but not too successfully. Lime in concrete will cause corrosion to the aluminum.

It would appear that aluminum conduits must be applied with great care and considerable caution. However, because of the increasing importance of this metal and its steadily decreasing relative cost, applications of aluminum conduit will no doubt be made in the pulp and paper industry.

Fiber Conduits. These conduits are universally accepted for underground installation with or without concrete encasement. The brittleness of this type of conduit is the primary reason why it is seldom used above the ground. The great possibility of breakage of exposed fiber conduits makes its use at best a calculated risk. Standard joints of this conduit are not threaded.

Fiber conduit will cost approximately 43 per cent as much as comparable sized black enamel conduit.

Plastic Conduits. Light, resistant to practically all chemical action, plastic conduit is homogeneous and therefore is not limited to the outer surface protection provided by some other conduits.

Unfortunately, it is not practical to bend in the field, and because of its insulating properties a ground conductor must be utilized to replace the conductance of the conduit. Some types of plastic pipe investigated as possible conduit material have been found to support combustion — a characteristic which of course cannot be tolerated for a conduit.

However, there is a definite possibility that in the future some form of plastic may be one of our leading conduit materials. While a high-impact type of plastic pipe today costs 214 per cent more than black enamel conduit, this price differential will probably decrease as time goes on.

Reducing maintenance

The importance of periodic painting must not be overlooked when considering means of controlling conduit corrosion in existing installations. Before the wide acceptance and use of zinc-coated conduits, painting was the only means of protecting the black enamel conduit from acid fumes and moisture. At Hammermill, a painting program is in effect which reaches all parts of the plant once every three to four years.

Since the initial cost of a conduit installation is a very minor factor — percentage wise — it should not, obviously, be the deciding factor in the selection of material.

The modern trend in plant construction is to erect buildings which are as free as possible of repetitive maintenance attention. Tile walls and floors, corrosion-resisting process piping and similarly protected electrical conduits are all forward steps in that direction.

Our ultimate goal must be to provide "long-life" conduit installations which do not require the expensive protective benefit of periodic painting. An installation which does not need such routine attention is most economical in the long run.

Sherardized steel conduits, with the additional protection provided by acid-resistant enamels and jackets, show great promise of extended service life even when exposed to corrosive chemical attack.

Since many plants will "write off" conduit installations in 20-25 years, it is both justified and desirable to specify specially treated conduits for electrical installations in the pulp and paper mill industry.

Packaging's impact

(Continued from page 219)

pensive, is the packaging operation. A topnotch product requires adequate protection during handling and shipment. Molded fibrous containers lend themselves in a unique way to the packaging, not only of many industrial products but consumer items as well. Molded pulp can be custom-engineered to give maximum protection at a minimum cost in interior protective packaging material. Also, shipping bulk can often be reduced. Fibrous materials can be molded into practically any shape, with few limitations. The material is resilient in character or can be stiffened as required. It is proving very effective in preventing damage due to impact shock and general rough treatment for many fragile articles. Molded fibrous material is often cheaper than conventional packaging materials; labor savings can be realized because it lends itself to automatic packing methods and elimination of costly set-up time.

Among the many argicultural and industrial products now being successfully packaged in molded fibers are the following: eggs, apples, sandwich spreads, fluorescent light tubes, Christmas tree bulbs, electrical parts, growing plants, cherries and glassware.

Packaging and selling aids

Without doubt the most powerful salesman in the self-service revolution has proved to be the paper label, appropriately designed and attractively printed. A good label is a tremendous advertising force in today's selling. Labels in many merchandising outlets have already taken over for the salesman, and this has also happened on TV programs. Paper is the basic medium for labels, and it can readily be adapted to various finishes, coatings and graphic arts reproduction thereon. Combined with other materials, artistic effects can be achieved. Heat-sealing tags are popular.

Packaging seals and tags are devices for furnishing product information to the salesman and to the consumer. Marking tags, for instance, are advantageous packaging accessories for many products. They serve to identify the product and to invite the buyer to read its message. Paper tags are symbols of quality and have become a versatile sales aid. There has been a definite trend towards an increased use of tags in this field. A recent survey showed that tags representing a product end-use standard are a top-notch marketing tool and provide the better labelling required for the increased self-service merchandising in retail stores. Frequently the history of the product can be traced by providing a number on the tag, in case of complaint. Wide use of cooperative labelling is being made, the label space being shared by those firms participating in the fabrication of the product and sometimes by a product-evaluation laboratory. Paper helps to sell tagged items.

Gift packaging has become the determining factor in the purchase of millions of presents for all occasions. Techniques of gift packaging are controlled by rapidly changing selling methods. Paper and other packaging materials are joined to form ever-changing patterns of decorative materials for this billion-dollar gift packaging market. Today's gift packaging business realizes the changes in the merchandising revolution. The trend to self-service, pointing to the package as the chief saleman, has placed an added premium on design that will speak for itself. Attempts have been made to incorporate the aroma of a packaged article in the coating of the package to provide sales appeal.

Pulp washing — a panel discussion

Moderator: Harry E. Weston, American Pulp & Paper Mill Superintendents Association

Panel Members: C. K. Textor, The Bauer Bros. Co.; H. K. Waters, Swenson Evaporator Co.; Ward Pitkin, Dorr-Oliver Inc. (substituting for Thomas B. Calhoun of Dorr-Oliver); Bruce Armstrong of Appleton, Wis.; C. W. Converse, Sprout, Waldron & Co. Inc.; and Edwin Kemp of Bauer Bros.

THE FOLLOWING is a continuation of a transcript of the discussion of pulp washing held December 4, 1956, as part of the Fifth Annual Pulp and Paper Conference at the University of Florida, Gainesville. For purposes of better continuity, the questions and answers have been regrouped, insofar as possible, under definite subject headings.

Consistency and washing efficiency

(Ward Pitkin, Dorr-Oliver Inc.) As Mr. Armstrong has spoken of the consistency coming from vacuum washers and the effect of that on salt cake loss, I would like to say that we do have varying consistencies coming from the final washer in the vacuum washer system. However, we have not paid too much attention to it. We can take the pulp off at a higher consistency if we find it will give more efficiency in the system. But, to date we have not found that to be the case. We usually range from 12 or 13 per cent consistency up to 20 per cent, as Mr. Armstrong said. We can put it higher than that. We can take pulp off the vacuum washer at 30 per cent, but we have not found that it increases the efficiency of the system. Otherwise, certainly in the multitude of installations we have, we would take it off at a higher consistency.

(H. K. Waters, Swenson Evaporator Co.) I tend to agree with Ward that you could remove pulp from the last drum of the washing system at a higher consistency. However, we have found in our work, also, that in doing so we do not improve the over-all efficiency of the washing system. The normal consistencies that are obtained in vacuum washing, varying as has been said between 13-20 per cent, gives us the best operating range.

(W. G. Dedert, Swenson Evaporator Co.) I would like to add a comment about this consistency. I, of course, side with Harvey and Mr. Pitkin on it. It is not necessarily beneficial on vacuum washers to go to a high discharge consistency. One of the reasons why that is true is because we are attempting to put water on this fiber and have it flow down through the sheets. After all, we are after 100-per cent displacement efficiency. As we go to a very high discharge consistency, we are forced to put less and less wash water and wash liquor on it. Our dilution is the water we put on minus the water that goes with the sheet. If we are going to go off with a small amount, we have to cut down the amount of wash water that goes on. As we cut down the amount that goes on, we are not able to get an even distribution of water and liquor on the sheets. Therefore, we reduce our chances to get this thing which we are all after, 100 per cent displacement. We increase the amount of fiber that does not have water evenly put on it. For that reason, we do not find that it helps us on the last drum of a multi-drum system to go to a high discharge consistency. Now, we do not feel quite the same way on the first drum. On the first drum it has been definitely to our advantage to come out as high as we can. This may be somewhat contrary to the idea of putting a press behind as against putting it ahead of the rotary washer. We can only speak for our own systems. On our own systems we know that we are ahead to come off at a high discharge consistency from the first drum in the vacuum system.

(Dr. W. J. Nolan, University of Florida) This may muddy the waters a little further for you. In all this talk about diffusion and displacement washing, I think you have another mechanism entering in here, especially when you go into the screw presses. That is capillary action. Now, you are going up to 40 per cent and maybe 60 per cent consistency. In that case, you are actually wringing out liquor from the lumens of the fiber. As an example of that, let us consider how much liquor the lumens will hold. Let us take the whole chip before cooking it at all and completely impregnate it with the cooking liquor by alternate application of liquor and vacuum, in order to replace all air or other gases in the lumens. In that case, we will end up with a chip which contains approximately 33 per cent solids and 67 per cent liquids. In the case of hardwoods, you will have a situation where there are vessels and other cavities which will take up water — in the pines we have the resin ducts. However, the predominant capacity for liquid in the chips is in the lumens. Therefore, the saturated conditions would indicate that there are approximately 2 lb. of liquid to 1 lb. of solids. Now, when we cook these chips, we have taken away the lignin and other non-water-bearing materials. Therefore, on the basis of 1 lb. of chips, we still have 2 lb. of liquid in the fiber lumens, but now we have only 1½ lb. of chips because we cooked to 50 per cent yield. We now have 1½ lb. of solid and 2 lb. of liquid — in other words, 20 per cent consistency. That 20 per cent consistency is water-free fiber as far as free fiber outside the fiber is concerned. Of course, that is not quite accurate, due to the fact that we have vessels and other hollows in the chip which will take up liquids. But theoretically, we would have in the pulp, when every bit of free water drains away, 20 per cent consistency. In vacuum washers, this probably doesn't affect results because the discharged pulp has considerable free, external water. When we come to a screw press, where we press to 40 per cent or 60 per cent consistency, instead of having 2 or more pounds of liquor to ½ lb. of pulp, we have less than 1 lb. of liquor. When water is added to that squeezed pulp, we have capillary action — just like adding water to a blotter. We have immediate motion of wash water into the lumen itself, not surrounding the lumen. After the water gets into the lumen, it mixes with the concentrated liquor that is still inside the lumen; a very rapid diffusion results, just as though you dropped a little bit of concentrated caustic into a beaker of water. Now comes the diffusion problem. We have the lumens filled with this diluted liquor, and it's necessary for this chemical to diffuse from the lumens out

through the fiber into the main body of liquor. Here is where diffusion time enters in the problem.

The reason I started thinking in this vein is because I talked to a lot of people on the problem; they claimed that for true diffusion of black liquor out into the main body of the solution it takes about 24 hours. That may theoretically be true in the laboratory; but, in the practical operation of a screw press I know it is not true. There must be some other mechanism entering into the operation; and I think we have this capillary action, too. By the way, I was wondering why somebody did not jump on Mr. Armstrong about allowing 20 min. retention time to get this diffusion when, theoretically from a purely diffusion point of view, it should be 24 hours. Actually, it's a mixture of two things, I believe, a rapid capillary action followed by diffusion.

(E. L. Dozier, Chesapeake Corp. of Virginia) Along that same line on the amount of retention time that should be allowed for diffusion or penetration of liquor or water between the stages in the screw press washer, we operate screw press washers in our mill at lower consistencies than these gentlemen were talking about. We go up to around 35 per cent and dilute back to around 10-12 per cent. In the laboratory we found that, if we allowed several minutes of retention between the time it was expelled from one press and liquor added and then fed to the next press, it would be beneficial and we would get a better wash. In practice, we found that, after we put in a tank or a chamber to allow that 2 or 3 min. retention, we could not find a difference that we could measure, We finally concluded that it was due very much to what was just said. In other words, water is applied immediately as the pulp is expelled from the press, while the pressure is being released, the pulp immediately absorbs the water or the wash liquor. Consequently, we dump the pulp out of one press into a 10- or 12-ft. conveyor and right into the next press, and there is no retention time other than a few seconds.

(John Natwick, Jackson & Church Co.) I did have a comment before Dr. Nolan talked, but he answered what I wanted to say. In pressure washing, you do press the liquor out of the inside of the fiber; whereas, with the vacuum washer, you are just washing from the outside. When you go into your vats, of course, you do some leeching. That is going back to Mr. Textor's paper, the old principle of washing with a diffuser — diffusion and leeching. I believe that you should have some time and low consistency in the neighborhood of 3-4 per cent to get good leeching and diffusion. After the liquor has been pressed out to 40 per cent consistency and the stock goes to a vat for leeching and diffusion, the washing will be helped considerably.

Q. (Dr. Nolan) I would like to ask Mr. Kemp a question. I believe you mentioned that you pressed to about 60 per cent consistency and then diluted down to 40 per cent or somewhere in that range. Can you give me some idea of the mechanical methods you used to accomplish that dilution uniformly? You are in a rather tricky range there for getting uniform dilution. I would like to find out how you did it.

A. (Edwin V. Kemp, The Bauer Bros. Co.) The water used as dilution water between the two stages is generally added in a screw conveyor ahead of the second stage. There is a problem of mixing it and getting thorough mixing of the water with the pulp from the first stage.

Q. (Dr. Nolan) It is done on a screw conveyor?

A. (Mr. Kemp) Yes.

(Mr. Pitkin) I believe that we might arrive at definite answers to some of these questions by some simple laboratory experiments. I would suggest that a sample of stock be taken from the blowpit. This sample could be washed on a buchner funnel with hot water to remove what you might call the maximum washable soda. Then, take this sample and press it in a laboratory press to 40 per cent consistency to see if some of the so-called bound soda would be removed. This would give us some idea of the effect of this pressing.

(Mr. Bruce Armstrong) That has been done. It was done in one of the mills. I happened to be there at the time. So, I have some data on it. We had the concept at one time that there was an irreducible minimum of soda that you could wash to. If you left it indefinitely in distilled water for days on end, it would not reduce further. That was given the name of bound soda. That has been pretty thoroughly exploded since that time. In the operation of a press, we must not confuse the concentration of solids in the liquor in the washed pulp with the total solids in the pulp. There is a distinct difference there. I tried to bring that out yesterday. If there is any residual left at all, and that is removed, whether it is in suspension or actual solution, you save less liquor remaining in the pulp at 40 per cent than you have at 20 per cent. You automatically have it in a direct mathematical ratio. If you remove that water, and with it the solids that are either in suspension or in solution—it does not matter which, you will have less soda in the washed pulp. That has actually been proved. We concede the idea that you could not hope to wash to less than 20 lb. of soda loss at 20 per cent consistency. In an actual mill installation of close to 300 tons we had no difficulty over a period of several months getting down to 6½ lb. salt cake loss on a kraft pulp. That was done on a commercial scale. So, I think that is quite clearly established now.

Q. (Mr. Dozier) Mr. Armstrong, let us consider your figures for a pressure washer with a dilution factor of 1½ and a salt cake loss of 12½ for the two stages. What consistencies are you dealing with there?

A. (Mr. Armstrong) We assume, in order to make comparisons throughout the entire paper on the same basis, that the pulp will be from a standard vertical digester. It will be blown at 10 per cent consistency. As blown, it would have 10 per cent total solids, in the liquor, enter the press at 5 per cent consistency and be discharged at 40 per cent. The press is quite capable of going down as low as 3 or 3½ per cent on most pulps and will go substantially beyond 40 per cent. We tried to be conservative in these estimates and keep them the same throughout the entire paper. Actually, in the mill the press feed may vary from 3 per cent to as high as 6 per cent entering consistency. We tried to keep in the pumping range for convenience. But, this is not necessary if a screw conveyor is used. Here, you can keep it at 10 or 12 per cent if you so desire.

Q. (Ernest G. Evans, Union Bag-Camp Paper Corp.) There are some of us that can conceivably afford to lose the 16 lb. of bound soda and have enough evaporator capacity but have a pollution problem. If we wash all of the soda from the outside of the fiber, how much soda is release when it is refined and when it goes over the paper machine? This is a very definite problem with us. The 10-16 lb. of soda is not too critical as far as economics are concerned, but if it is not removed over vacuum washers or through diffusers and is released in

(Continued on page 256)

THE BIRD VIBROTOR SCREEN

These figures will give you an idea of the quantity and quality of stock screened by Bird Vibrotors.

- **105 tons of unbleached sulphite at 1.5% consistency**
- **110 tons of de-ink paper stock at 2.2% consistency**
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CURRENT COMMENTS

Limited optimism . . . an increase in paper use . . . and FAO report

by WARREN B. BULLOCK

Facts are facts, though not always pleasant to face. While industry leaders are optimistic to a limited degree over the outcome of the year's operations, reports of earnings of a score of the major paper manufacturing companies (listed below) tell an almost uninterrupted story of reduced net earnings — with an increased volume of sales. Annual meetings of some of the larger companies produced discussions of the economic future of the industry as a whole and of the individual companies in particular.

John H. Hinman, chairman of the board of International Paper Co., is quoted in the newspapers as having told stockholders that the present financial picture represents a leveling-off in the entire paper industry, and that prices have not kept pace with the increases in labor costs, materials purchases and transportation costs. He expected that earnings in 1957 would be lower than in 1956, but that there was no fear of a cut in dividends.

St. Regis Paper Co. experienced a drop in net income of over $1,500,000 in the March quarter as compared with the first three months of 1956. After Chairman Roy K. Ferguson told the company's annual meeting that the firm must exercise prudence in maintaining working capital in relation to profits and dividend payments, it was voted to reduce the dividend on the common stock to 35 cents per share as compared with previous payments of 50 cents.

Marathon Corp. has announced that it is slowing down its growth and modernization program to spend $82,000,000 in six years instead of in the four years originally planned. By the end of 1959 the company expects to have expended $57,000,000 of the total.

A favorable view

On the other side of the picture, however, an important Philadelphia firm of investment bankers takes a favorable view of the future of the industry. In a special review and analysis of the Mead Corp., Drexel & Co. looks for a per capita increase in the use of paper in 1957 of 12 to 13 lb. over 1956, which in turn was up 17 lb. from the previous year. This is without allowance for the increased population. The report further says: "The growth in demand for paper and paperboard will continue and will offset any difficulties arising from over-capacity." Mead is rated by this banking house as No. 7 in the list of United States paper manufacturing companies.

A parallel analysis of the status of the paper industry in Canada shows a check in the spiral of upward corporation profits, and again higher costs of conducting business is the ascribed reason. One cause for the drop in profits is the discount on American dollars, which causes a loss of 4 to 5 per cent on United States sales.

Part of the problem

The United States Bureau of the Census in its report of production through February spells out part of the paper industry's problem. Paper and board production in February was 6 per cent below the 2,599,299 tons produced in February of 1956. Paper production was 2 per cent below the 1956 figure, but paperboard showed a falling off of 10 per cent.

In spite of all the above, it must be recognized, however, that paper has suffered no more than other major industries; and blue chips continue to be blue, even though the upward surge in industry activity has been checked, presumably temporarily.

Titanium: a fast-growing industry

A newspaper writer has devoted considerable attention to the development of the titanium industry with a growing list of uses in which this rare metal is coming to the fore. The use of titanium salts to add opacity to paper for printing purposes has been only one factor, perhaps a minor one, in the growing use of this metal. This survey shows that in 1946 the United States produced only 3 tons of titanium, with a price of approximately $5 per pound. But that price has been cut nearly in half with an expected production in 1957 of 25,000 tons. One enthusiast predicts 1,000,000 tons a year in the comparatively near future.

World-wide report

An official report, dated 1956, from the Food & Agriculture Organization of the United Nations has devoted a section to the pulp industry. It shows an increase in production of 9 per cent during 1954 to a record high of 48,000,000 tons, with the largest increase in Africa, Asia and Latin America. United States production of all categories of paper and paperboard is reported as 58 per cent of the world total. The chief interest in these figures is in the upward trend in the pulp field. However, the trend is identical with that of current unofficial estimates from domestic sources. That the FAO report is world-wide and official makes it of value, even though it cannot be as up-to-date as the unofficial figures from industry sources, due to the difficulty in securing precise data from the more backward pulp-producing nations.

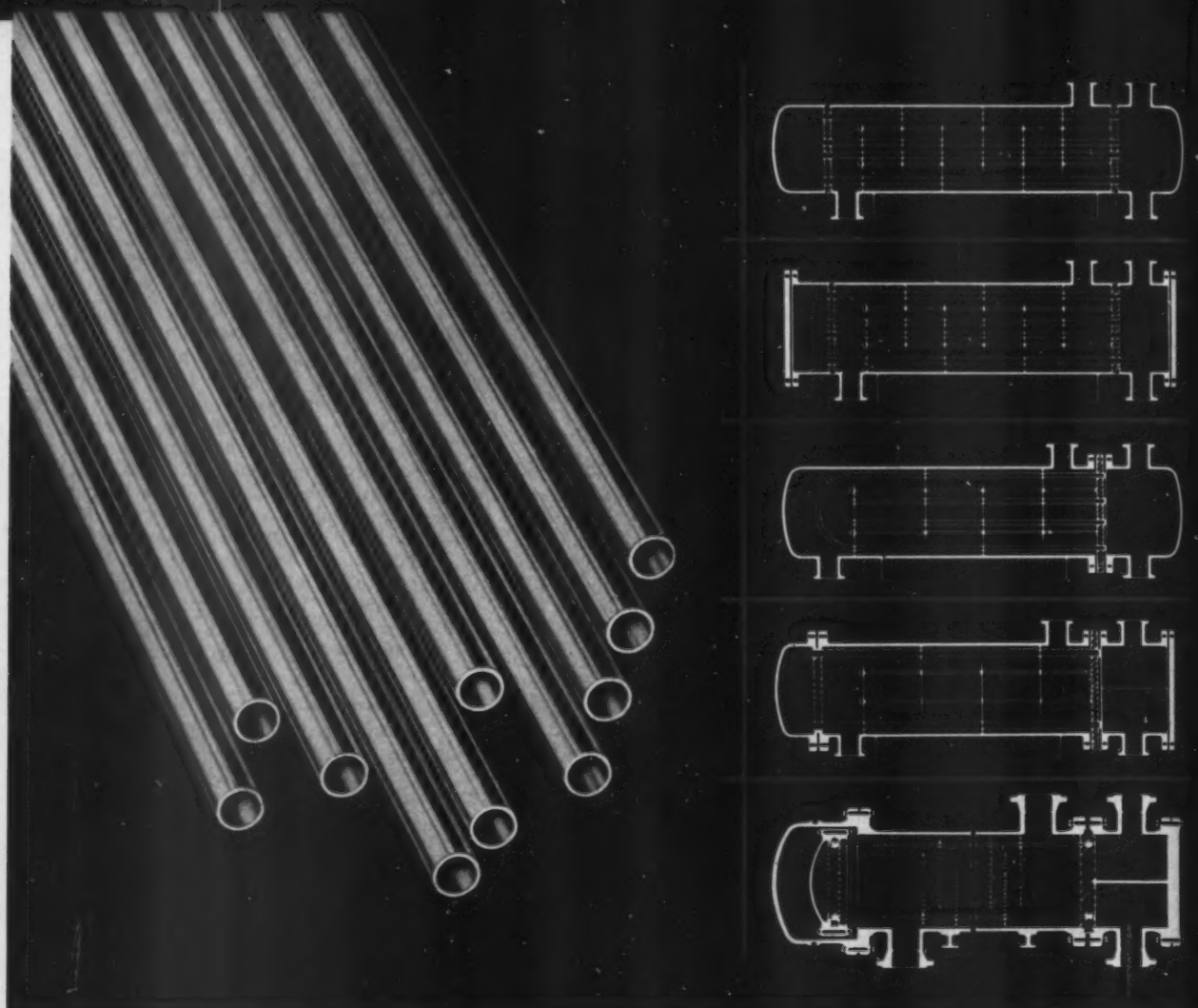
Financial Reports

Paper mill securities were not too buoyant in the stock market during April and early May, due chiefly to the lack of optimism in the production and profit figures issued for the first quarter of the year. A few issues, however, ran counter to the trend because of specially favorable conditions in individual firms.

Net Incomes

American Writing Paper Corp.—Net income for the first quarter of 1957 was $173,171, as compared with $189,729 a year ago.

Certain-Teed Products Corp.—Net income for the March quarter was $254,405,



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Current Comments . . .

as compared with $439,172 a year ago.

Container Corp. of America—Net March quarter income was $3,848,000, as compared with $4,689,000 a year ago.

Crown Zellerbach Corp. — Net 1956 net income was $50,000,000, or over 13 per cent higher than the $40,000,000 earnings in 1955, not including in the 1956 figure a profit of $24,000,000 resulting from the company's sale of its investment in Fiberboard Products Inc.

Eddy Paper Corp. — Net income for 1956 was $1,817,062, as compared with $1,538,917 a year earlier.

Fort Wayne Corrugated Paper Co. — Net income for 1956, $1,101,262; in 1955, $1,094,909.

Keyes Fibre Co. — Net income in 1956 was $1,255,272, as against $1,468,148 in 1955.

Masonite Corp. — Net income for three months ended February 28 was $862,774, as compared with $1,563,659 for the comparable period a year ago.

Mead Corp. — Net income for 1956, $13,385,267; in 1955, $10,643,135.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing prices	May 10, 1957	April 10,1957
Celotex	34¾	34
Same Pref.	*18-18½	18¾
Certain-Teed	9¾	10⅜
Champion P & F Co.	35	35⅛
Same Pref.	94½	97
Chesapeake Corp.	25¾	26¼
Container Corp.	18½	20⅜
Same Pref.	*85-91	*90-92
Crown Zellerbach	51¾	53¼
Same Pref.	95½	*98-98½
Dixie Cup	66½	63
Eastern Corp.	*26½-27	29¾
Federal Paper Board	35	34½
Same Pref.	19¾	*19-19½
Fibre Paperboard	28⅛	29¼
Same Pref.	100	101
Great Northern	80½	*83-84
Hammermill	33¾	35
International Paper	102¼	99⅛
Same Pref.	*90-92	94½
Kimberly-Clark	43¼	45⅝
McAndrews & Forbes	35⅛-35¾	36⅜
Marathon	27⅜	27½
Masonite	31¼	29
Mead Corp.	37⅛	35⅜
Same Pref.	*91	*90-92½
Minnesota & Ontario	32¼	35¼
Oxford Paper	39¼	41¼
Same Pref.	92-95	*92½-94½
Rayonier Inc.	25¾	28⅛
Riegel	*28⅜-29	27½
Scott Paper	61¼	59½
Same $3.40 Pref.	85	83
Same $4 Pref.	96¾	96½
St. Regis Paper	32⅛	39⅜
Same Pref.	*94-96	*94-95½
Sutherland Paper	36⅛	36⅛
Union Bag-Camp	31½	33
United B & C	24½	24⅜
United Wall Paper	8¾	9
Same Pref.	*17-18	*14½-15½
U. S. Gypsum	58	55
Same Pref.	*160¼-162	*160-162½
West Va. P. & P.	38¾	41
Same Pref.	*103¼-104½	*104-105

New York Stock Exchange — Bonds

Champion P & F Co. 3¼%	97½	97½
Champion P & F Co. 3%	—	91¾
Mead Corp. 3%	—	92¼
Scott Paper 3%	97½	98¾

American Stock Exchange — Stocks

American Writing	—	21
Brown Company	15¾	16⅛
Puget Sound	15⅞	16⅜

*Closing Bid and Asked Prices.

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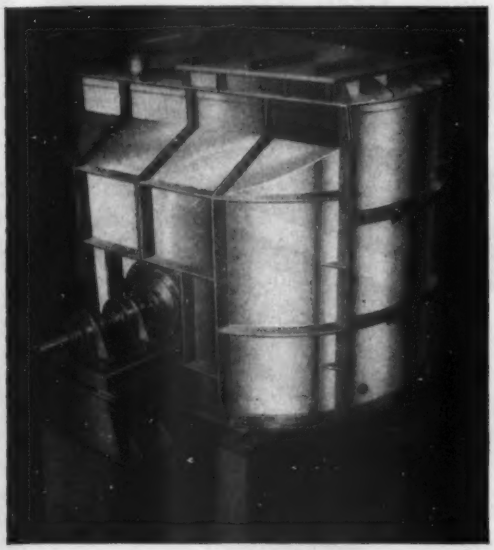
Jones HI-LO PULPER



Engineered to eliminate the compromise imposed by conventional single-rotor pulpers between maximum circulation and complete defibering, the HI-LO employs two separately powered rotors to provide maximum pulping *and* complete defibering, with significant savings in time and power. For details, ask for Bulletin EDJ-1063.

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The only unit of its kind with *two stages of refining* in one machine, the Jones Double-D can actually do twice the work of conventional refiners because it has double the refining area — 2200 square inches in the 42" model; produces stock of equal or better quality at a considerable saving in operating cost. Ask for Bulletin EDJ-1083.

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Like all Jones Jordans, the Royal incorporates exclusive Jones features developed in more than a century of service to paper mills. In addition, the Royal, a war-born unit developed originally to process nitrocellulose has some special features worth investigating. Ask your Jones representative or write for Bulletin EDJ-1007B.

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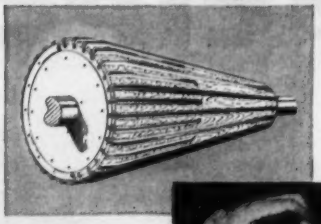

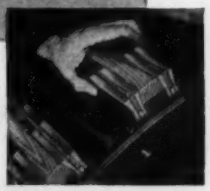

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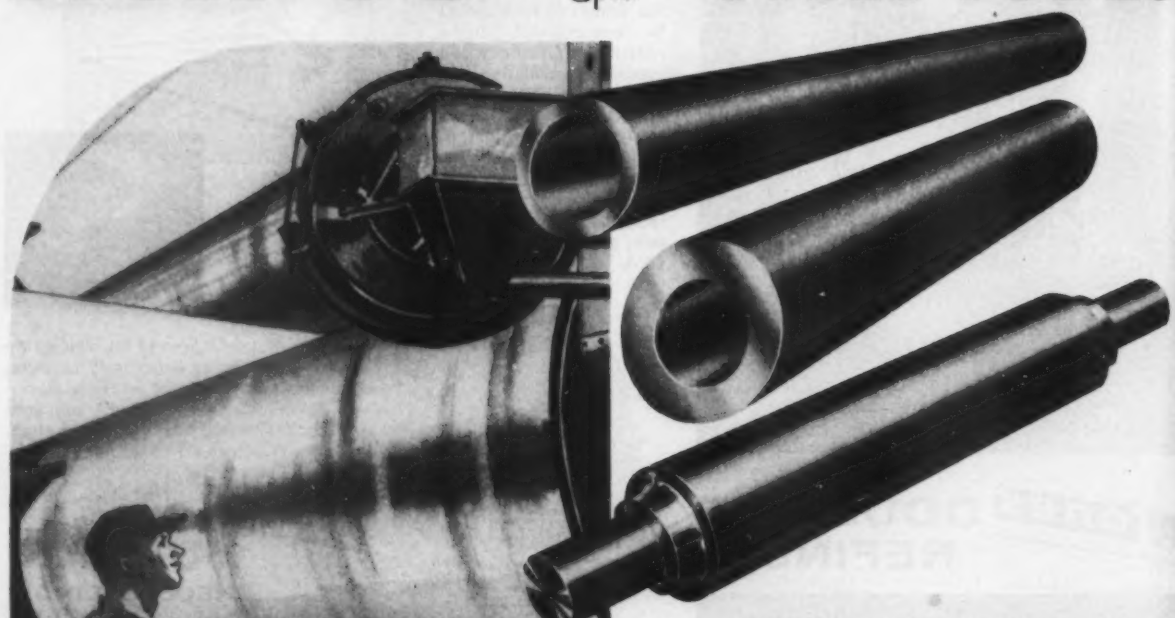

With paper and pulp production on the increase every year, each mill machinery component must do more — faster. Rolls must turn at higher speeds. With higher speeds, better roll balance and greater dimensional stability are required to avoid both excessive wear and fluctuation in paper quality caused by vibration.

ACIPCO centrifugally spun steel tubes offer extra advantages for both roll fabricator and paper or pulp producer.

- Because ACIPCO centrifugally spun steel tubes are inherently dimensionally stable, dynamic balance is easier to attain.
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- ACIPCO steel tubes are produced with the exact physical, chemical and metallurgical properties your application requires.

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VERSATILE ACIPCO Centrifugally Spun STEEL TUBES

are used in the manufacture of calender, engraving, press, slitter, rewinder, plate cylinder, squeeze and starch bath rolls, as well as in hundreds of other industrial applications.

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NEWS of the INDUSTRY

Consolidated Water P & P to Build $500,000 Pulping Liquor Recovery Plant

A major step in Consolidated Water Power & Paper Co.'s stream improvement program on the Wisconsin River was to be taken in June with the construction of a $500,000 experimental pulping liquor recovery plant.

The unit will recover chemicals for re-use in the firm's semichemical pulp manufacturing and if successful will be expanded to include the processing of all collectible spent sulfite liquor.

Incorporating a new process developed by Western Precipitation Corp. of Los Angeles, the plant will process all collectible solids from semichemical pulp operations.

In 1956 Consolidated substantially reduced its load of sulfite liquor to the Wisconsin River when it converted a third sulfite pulp digester to semichemical production.

Mosinee Expands High-Density Pulp Storage

In order to permit greater flexibility in pulping operations, Mosinee Paper Mills Co. of Mosinee, Wis., has installed two 100-ton silos for the storage of high-density pulp. In addition to the tile-lined units, the expansion project includes equipment to de-water screened pulp, deliver it to storage, and dilute and pump from storage to the beaters.

According to the company, the completely automatic system—designed by Mosinee's staff in conjunction with Chas. T. Main Inc.—is the most modern of its type in the world. Automation controls the filling, storage, withdrawal and consistency of the pulp through an elaborate set of electronic controls.

Builds Testing Chamber

Mosinee has also recently completed the installation of a tropical testing chamber. The principal purpose of the facility is to test the effectiveness of moldproof papers in resisting microbiological attack and the resultant deterioration.

The room is 16 by 20 ft. and 8 ft. high and is fully insulated against changes in pre-selected temperatures and relative humidity. The chamber was designed and built by the Mosinee staff.

Trees Planted in 1940 Enter the Production Line: a St. Regis Landmark

St. Regis Paper Co. has reached a significant landmark in forestry. Early this spring the first trees planted to support the firm's southern mills at Pensacola, Fla., were harvested and made into paper.

Paper was first produced at Pensacola in August of 1941. The trees harvested in 1957 had been planted during the preceding winter while the mill was under construction.

The specific plantation—240 acres in what is now the Jay Working Circle in Santa Rosa county—is yielding approximately 6.5 cords per acre in the present harvest. It is estimated that the operation leaves 10 cords per acre in trees that will be harvested at a later date.

(While the present harvest supplies only a small fraction of the pulpwood needed—and that for only a very short time, it marks the achievement of a goal set even before the first roll of paper was produced at Pensacola. Company officials point out that despite the significance of this first harvest it will be many years before company-planted trees will be more than a token supply of wood.)

Trees planted this year on the same schedule will be ready for harvesting as pulpwood in 1971. In comparison with the 240 acres planted in the 1940-41 season, a total of 15,500 acres were planted by St. Regis in its forests during 1956. In all, the company has planted some 65,000 acres to produce pulpwood for the Pensacola mills. This planting is in the ratio of four new seedlings to every mature tree used in the mill production line.

During the past 15 years St. Regis has worked to improve the timber stands of private landowners in the areas of Alabama, Florida and Mississippi. Without cost or obligation to the landowners, more than 18,000,000 slash pine seedlings have been given to independent farmers, woodlot and forest owners.

Growing Cushion Between Output and Demand Forecast by Commerce

THE PAPER AND BOARD industry operated at near-capacity levels during 1955 and the first half of 1956, according to an economic review recently released by W. LeRoy Neubrech of the Business & Defense Services Administration in the Department of Commerce. During that period, he said, a tight balance existed between supply and demand, with indications of shortages in some grades—particularly newsprint. (Neubrech is assistant director for pulp, paper and paperboard in the Forest Products Div. of B&DSA.)

In the latter half of 1956 there was evidence of some inventory accumulation by converters, wholesale merchants and consumers, notably in paperboard and newsprint. This caused a leveling in production in some grades late in 1956 and early this year. However, Mr. Neubrech points out that actual ultimate consumption has undoubtedly continued steady during the past several months—probably paralleling the month-to-month Federal Reserve Board index of industrial production.

Total paper and board tonnage output in 1957 is expected to exceed or at least equal that of 1956 but at a slightly lower production ratio compared to capacity. Growing domestic competition is anticipated, intensified to a degree by a possible decline in exports and an increase in import offerings.

Substantial new capacity additions for pulp, paper and paperboard during the past two years—with further new installations coming into production in 1957—point to a

United States Paper and Paperboard Production—1947-1956

(1000 short tons)

Type of Product	1956*	1955	1954	1953	1952	1951	1950	1949	1948	1947
All types	31,336	30,140	26,876	26,605	24,423	26,048	24,375	20,316	21,897	21,114
Paper, total	15,262	14,481	13,077	12,739	12,197	13,011	12,064	10,349	11,119	10,705
Newsprint	1,615	1,459	1,202	1,069	1,109	1,108	1,013	918	876	833
Groundwood	966	882	788	771	806	791	705	674	772	821
Printing	756	702	613	600	589	519	488	484	538	546
Converting and other	210	180	175	171	217	272	217	190	234	275
Machine-coated paper	1,512	1,312	1,222	1,182	1,096	1,113	1,020	887	809	627
Book paper	1,786	1,725	1,577	1,603	1,482	1,610	1,579	1,416	1,570	1,581
General printing	1,068	1,036	964	1,000	959	1,035	1,008	926	1,067	1,070
Converting	686	677	602	593	513	558	557	476	485	498
Other book paper	32	12	11	10	10	18	14	14	18	13
Fine paper	1,605	1,464	1,285	1,299	1,295	1,366	1,199	1,015	1,141	1,172
Writing paper	1,261	1,150	1,007	1,029	1,052	1,093	958	806	909	918
Rag	152	126	121	131	132	161	138	120	138	174
Chemical wood	1,109	1,024	886	898	920	932	820	686	771	744
Cover and text	106	95	83	75	59	63	61	63	72	93
Bristols	127	119	106	107	106	109	102	79	88	87
Thin paper†	111	100	89	88	78	101	78	67	72	73
Coarse paper, total	3,934	3,682	3,462	3,385	3,238	3,626	3,298	2,758	3,027	2,903
Glassine, greaseproof and vegetable parchment	158	165	154	149	138	177	162	141	151	156
Wrapping	672	665	665	627	651	705	713	692	726	667
Bag paper	1,118	986	927	896	797	838	754	690	736	540
Shipping sack	856	837	791	759	753	849	748	510	567	671
Converting	1,130	1,029	925	954	899	1,057	921	725	847	869
Special industrial paper (including absorbent)	689	604	501	554	516	538	460	335	415	390
Sanitary paper	1,537	1,528	1,386	1,274	1,148	1,244	1,148	1,008	983	894
Tissue paper	247	239	226	231	209	229	217	187	205	195
Building paper and insulation	1,371	1,586	1,428	1,371	1,298	1,386	1,425	1,151	1,321	1,289
Board (all types), total	16,074	15,659	13,799	13,866	12,226	13,037	12,311	9,967	10,778	10,409
Container board	7,823	7,542	6,488	6,653	5,766	6,323	5,830	4,680	5,079	4,944
Folding boxboard	2,573	2,592	2,440	2,445	2,193	2,362	2,352	1,943	2,024	2,257
Special food board	1,256	1,156	1,001	954	799	772	655	516	443	460
Set-up boxboard	804	793	718	747	687	733	712	617	596	595
Cardboard	107	86	87	75	69	85	87	83	87	92
Building board	1,671	1,611	1,473	1,374	1,305	1,269	1,220	839	1,270	1,072
Wet machine board	147	183	136	156	139	148	166	131	142	150
Other board	1,693	1,696	1,456	1,462	1,268	1,345	1,289	1,158	1,137	839

*Preliminary. †Includes small amounts of "other fine papers". Source: Prepared by the Forest Products Div., Business & Defense Services Administration, and based on data from the Bureau of the Census.

growing cushion between potential output and demand.

Tightness at an End

During the first quarter of 1957 most paper and board mill operations were steady and did not record the upward advances made in early 1955 and 1956. Wholesale merchants, converters and most other consumers—according to Neubrech's findings—realize that current and potential supply is adequate to meet their needs; also, that the tight situation of 1955 and 1956 is at an end.

As a consequence, orders are being placed in smaller units for immediate delivery, while inventories are being reduced.

An All-Time Record

Total production of all grades of paper, paperboard and construction paper and board during 1956 established an all-time record of 31,300,000 tons, an increase of 4 per cent over 1955. Paper grades at 13,900,000 tons gained 7.7 per cent; paperboard at 14,300,000 tons increased 2.8 per cent; construction paper and board at 3,000,000 tons declined 4.8 per cent.

The long-term average rate of increase for the pulp and paper industry has been about 3½ per cent compounded annually, earmarking the industry as being one of the fastest growing in the United States. The outlook is for a continuation of this growth rate in the years ahead.

Shipments at $10.7 Billion

It has been estimated that during 1956 the pulp, paper and board and allied products industry shipments were valued at $10.7 billion. Some 463,000 production workers (not including pulpwood logging) earned wages totaling $2.1 billion. Pulpwood consumption stood at 35,800,000 cords, while waste paper consumption was 8,900,000 tons. (Allied products include various converted paper and board items such as boxes and bags.)

Wood pulp production in 1956 exceeded 22,000,000 tons, a gain of 6.7 per cent over 1955. Consumption—which includes imports—totaled 23,800,000 tons, also 6.7 per cent above 1955. Inventories of pulp increased by about 115,000 tons, or nearly 15 per cent, during the year.

According to the Securities & Exchange Commission, the paper and allied products industry reported net profits after taxes of $490,000,000 during the first nine months of 1956, compared to $438,000,000 in the same period of 1955, for an increase of 11.9 per cent.

News of the Industry . . .

Gardner Announces $7,500,000 Expansion

Plans for a $7,500,000 expansion project during the next three years nave been announced by Gardner Board & Carton Co. at Middletown, Ohio. Plants at both Middletown and Lockland will be affected.

New buildings to house additional equipment will be erected at both locations. And a new plant for Manchester Machine Co., a Gardner subsidiary at Middletown, is also planned.

Improvements to be included in the over-all project will include:

1. At Lockland—a steam boiler with a 100,000-lb. per hr. capacity, an electrical substation, water-treating facilities and a non-condensing turbo-generator.
2. At Lockland—a new building to house the rotogravure printing operation and two rotogravure presses.
3. At Middletown—a line stock preparation system for the paperboard mill housed in a 20,000-sq. ft. one-story building.
4. At Middletown—a four-color offset press at the carton plant and a building to house more offset and letterpress equipment.
5. At Middletown—a new type 90-ft. coater in the No. 2 board mill.
6. At Middletown—a new plant for Manchester Machine comprising about 75,000 sq. ft. and a 6000-sq. ft. office building.

New Thilmany Dryer Ready for Delivery

The largest Yankee paper machine dryer ever ordered by an American paper mill for the production of strong machine-glazed paper is scheduled for delivery in June to Thilmany Pulp & Paper Co. in Kaukauna, Wis.

The unit was manufactured in England by Bentley & Jackson Ltd. and was delivered in Milwaukee in May. However, it cannot be hauled to the Thilmany plant until concrete highways are repaired after the spring thaw.

The $100,000 unit is 15 ft. in diameter and 168 in. across the face. Its weight is 69 tons and will be installed as part of the firm's new No. 12 machine.

(Turn to page 238)

Superintendents Convention

(Continued from page 222)

For in this manner two goals are reached: (1) the employee is made to feel important in over-all company operations, and (2) frequently employee suggestions result in increased efficiency and economy—in the plant as well as in the office.

Following up on the suggestion system, H. F. Taylor Jr. of Scott Paper Co. in Chester, Pa., discussed, "Selling Production Efficiency to Mill Personnel!"

Good communications, he said, is a prerequisite to good supervision and therefore to good relationships with the man in the plant.

Without effective communications, the best ideas for good community and employee relations will go awry.

And good communications are based on: (1) the backing of management; (2) tangible objectives; (3) proper planning; (4) good promotion; (5) local operation, and (6) positive selling.

No whisperers here

A whisperer cannot be a leader. According to Lucille La Chapelle of Itasca, Ill., this is one of the big problems faced by all industry—that of voice in leadership.

Addressing the general session on Communications, Miss La Chapelle discussed, "You Are Better than You Sound."

Men otherwise qualified for leadership, she said, are often passed by merely because they have never learned how to speak—and hence how to put across an idea. These men are lost to industry.

Other voice weaknesses pointed out by Miss La Chappelle were those of the gutteral sound and the monotone. One is equally as bad as the other; and neither creates the "sound" of leadership.

Many a valuable idea is lost to industry, the speaker concluded, simply because the body, the mind and the voice do not say the same thing.

No matter how one sees it, life is a series of controversies—some big, some small. So said Dr. Ralph G. Nichols in his talk, "Psychology of Persuasion", at the first general session.

Dr. Nichols, who is on the staff of the department of rhetoric at the University of Minnesota's Institute of Agriculture, declared that undoubtedly both sides win when a controversy is settled through talk. Both sides invariably lose when a fight is the answer.

Remember, he advised, that the position of your competitor makes sense to *him*. Agree with him wherever possible. But, add that one telling point—that undebatable argument with which he must agree. You will have proved your stand and at the same time will have saved a friendship that might have otherwise hit the rocks.

Agree while disagreeing, Dr. Nichols concluded, to insure against the hard feelings that can put to rout good company relationships that have survived the years.

Concluding the session on Communications, Edmund N. Greene of Monsanto Chemical Co. discussed, "Brain Storming—How We Do It."

That the group is more productive than the individual, he said, is best demonstrated in a bull session where ideas are put forth.

Such brain storming meetings should rely altogether on a free flow of ideas and *not* on the judgment of those ideas. For judgment tends to promote criticism, which in turn tends to discourage original thought.

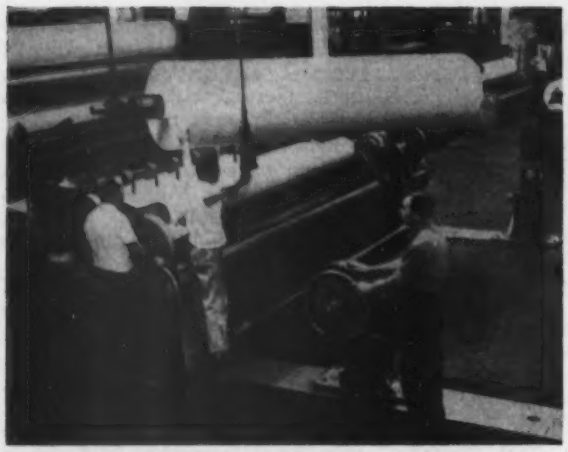
Brain storming is a device used solely to guarantee the birth of ideas by a group. Premium must be placed on the quantity of ideas proposed and not on their quality. And relaxing surroundings are most apt to create an aura of originality.

Through these sessions many firms have solved production and procedure problems that might have otherwise continued to plague operations. For the employee as an individual is intellectually productive if given a chance. He is the one who is closest to almost any given problem. It is he who is most apt to offer its solution.

Plant visits

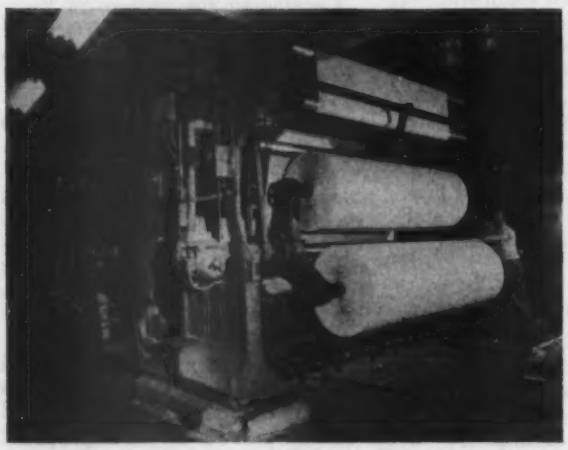
Plant visits on the convention program included trips to Pioneer Paper Stock Co., Container Corp. of America and R. R. Donnelley & Sons Co.

Association officers for 1957-58 in addition to Bachmann and Wood are: Howard E. Wehr, the Mead Corp., first vice president; A. C. McCorry, North Western Pulp & Power Ltd., second vice president; Thomas S. Coldeway, St. Joe Paper Co., third vice president, and C. Ives Gehring, Oswego Falls Corp., fourth vice president.



FIRST ROLL of rawstock came off No. 2 machine on December 20.

FIRST SKID at No. 6 trimmer for trimming and stacking.



FIRST THREE rolls on the wood reel of No. 8 coater.

OFF THE DELIVERY end of a four-color Haynes press.

Champion-International Produces Paper for Inauguration Program

THERE WAS NOTHING particularly unusual about Order No. 5709 at Champion-International Co. Mechanically, that is. The Lawrence, Mass. firm had been handling similar production jobs for years.

The order called for 67,000 lb. (278 reams) of 70-lb., blue white CICO-Duoset, 46 × 71 — 241. Routine.

The difference lay in the end use. The paper was to be used in the official program for the 43rd inauguration at Washington.

The story had its beginning early in December, when Stanford Paper Co. of Washington placed the order for delivery on or before January 2. The program would be printed by Haynes Lithograph Co. in Rockville, Md.

This was the second time that a Champion-International paper had been selected for use at a Presidential inauguration, CICO-Offset having been picked in 1953.

Order No. 5709 began to take shape on the night of December 20 on No. 2 paper machine. The first shipment took place on December 27. Some 175,000 copies of the official program were printed.

FIRST COPY OF the inaugural program is presented to Dr. Robert V. Fleming (r), a director of Champion-International and head of the inaugural committee, by Kenneth B. Haynes, president of Haynes Lithograph. In the center is Harry L. Merrick, chairman of the program committee. The sketch on the cover was done by the noted American artist, Norman Rockwell. (In addition to his duties as a C-I director, Fleming is chairman of Riggs National Bank of Washington and trustee of the National Geographic Society.)

Autopsy for a Short-Lived Felt

That liquid being "eye-dropped" on a sheet of paper was once the wool fiber of a papermaker's felt. Changed by the miracle of modern chemistry into a solution of "solubilized wool," it is about to be tested by *paper chromatography*—a *new*, Huyck-discovered technique for detecting chemical damage in paper machine clothing.

This *newest* of Huyck's "practical aids" for papermakers enables Huyck technicians to determine quickly and accurately whether felt deterioration is the result of attack by chemicals unfriendly to felts.

With this broad knowledge of typical felt deteriorating factors, Huyck applies more advantageously the *new* chemical treatments and synthetic fibers which toughen felts against chemical damage. *The result: better production at lower felt cost per ton!*

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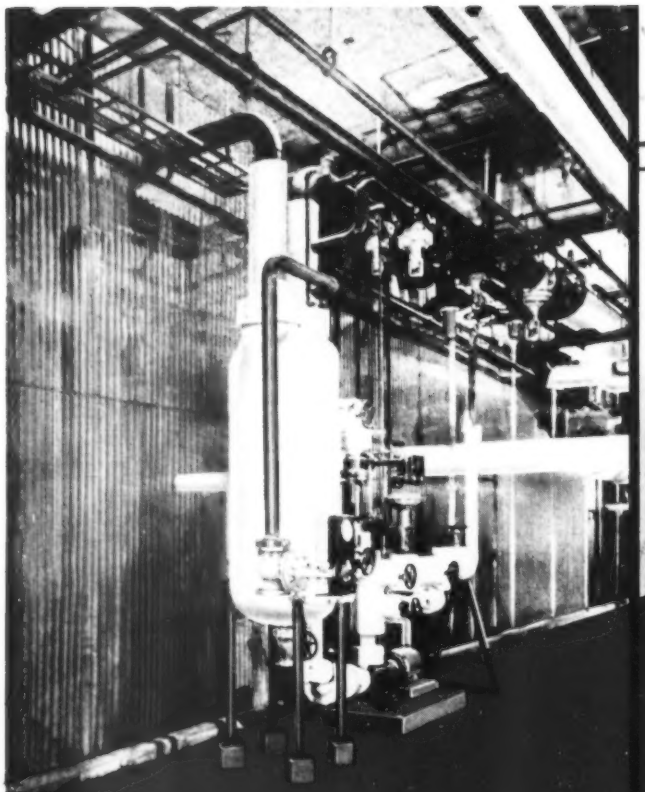

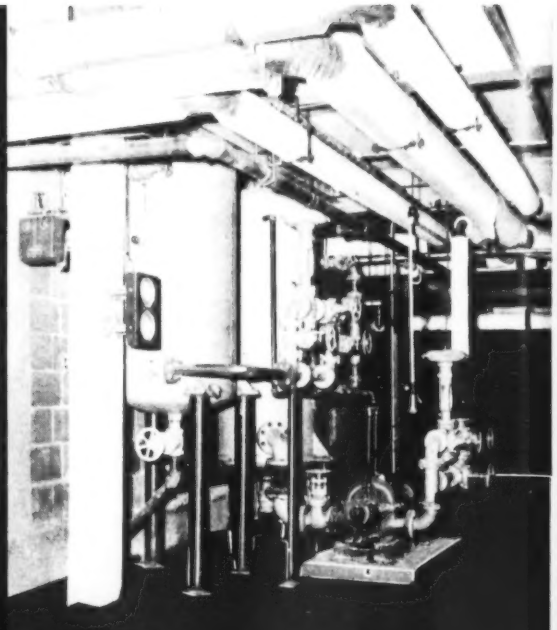

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News of the Industry . . .

Upturn In Paper Sales Seen by September

A pickup in sales in the paper and paperboard industry has been forecast for September by David Morgenbesser writing in the New York *Journal of Commerce*. By that time—at the latest—the present period of inventory dehoarding by consumers will have run its course. And industry sources believe that a new upturn in ordering will take place.

The significant point in evaluating the market situation, the article explained, is that actual consumption is holding up. And despite a dip in the demand for some packaging materials, the factors basically responsible for the sharp rate of postwar growth in paper and paperboard are still present.

In the non-packaging fields, continued heavy advertising and promotional activity remain the dominant factors in the relatively heavy consumption of printing papers, magazine papers and newsprint; while fine papers also continue to inch upward. And there are no indications of any drop in the use of either industrial or household tissues.

Morgenbesser continues: "Right now the big question is whether companies ran away with themselves in expanding productive capacity. A good deal of concern that this may be the case has been expressed in recent months by industry executives, but the feeling is by no means unanimous".

Higher Construction Costs

According to a recent survey released by McGraw-Hill Publishing Co., paper and pulp manufacturers spent $518,000,000 on plant and equipment in 1955, $801,000,000 in 1956, and plans for this year call for $985,000,000. However, much of the increase represents higher construction costs plus equipment to make possible more efficient operation.

Paper industry executives have emphasized that the present situation—with its softer markets and downturn in sales and earnings—can be evaluated only in relation to some norm. As a result of inventory liquidation, the industry has been running sluggishly as compared with last year. But, 1956 was a period of abnormally high activity, with many segments just about bursting at the seams.

Compared, on the other hand, with the level of activity in many other industries, paper and paperboard operations take on a new light. In all three broad categories of the field—paper, paperboard and newsprint—operations so far this year have been running above 90 per cent of capacity. Morgenbesser says, "That's nothing to sneeze at".

Optimism is high. At a recent stockholders meeting, Thomas B. McCabe, president of Scott Paper Co., had this to say: "The company expects to be confronted with somewhat higher costs and exceedingly keen competition for at least the major part of this year". He expressed confidence, however, that the present situation in which paper production in this country has generally overtaken demand is temporary.

In the Canadian paperboard industry the order backlog is reported to be the lowest in many years, and it is generally running about seven or eight days as compared to the usual three weeks. Although first quarter container board production was up about 5 per cent from 1956, boxboard output was off nearly 7 per cent. In both cases, however, volume is ahead of early 1955.

At the same time, Canadian fine paper mills may be facing a squeeze between rising costs and slackening orders. They will have the advantage of last year's price increase for the full year, but higher costs have largely—if not entirely—absorbed the boost.

1957-58 EXECUTIVE COMMITTEE of the Folding Paper Box Association named at the association's recent annual meeting (l to r): seated—Bayle M. Richardson, Richardson-Taylor Globe Corp. of Cincinnati; FPBA President Norman F. Greenway of the Robert Gair Div. of Continental Can Co. Inc., and William B. Leavens Jr., Wilkata Folding Box Co. of Kearny, N. J. Standing—William H. Walters, U. S. Printing & Lithographing Co. of New York, N. Y.; Leo H. Schoenhofen, Container Corp. of America, Chicago, and William J. Alford III, Alford Cartons of Ridgefield Park, N. J. Absent at the time was Arthur N. Morris, Newth-Morris Box Corp. of Jacksonville, Fla.

Also in Canada, Harold S. Foley, chairman of the board of Powell River Co. Ltd., has warned of indications that newsprint will be in oversupply on the West Coast by the end of the year.

Some portions of Powell's 1957 newsprint contracts have been cancelled by publishers, he said. However, should an oversupply develop, his firm does not expect production to fall below 95 per cent of capacity; and it will probably average between 96 and 98 per cent.

Hammermill to Renovate No. 6 Machine at Erie

The wet end of No. 6 paper machine at the Erie, Pa. plant of Hammermill Paper Co. is to be completely renovated this summer. Included will be the installation of a new inlet, fourdrinier, press section and four additional dryers.

The new cantilever-type fourdrinier is largely of stainless steel construction. It has been estimated that a wire change will require approximately one hour.

Manufactured by Valley Iron Works, the fourdrinier and press section have been designed for a production speed of 1200 fpm, an increase of 50 per cent over the present speed of No. 6. Measuring 112½ in. in

width by 83½ ft. in length, the fourdrinier is designed with a two-point shake. It is 20 per cent longer than the unit it replaces.

The press section has two conventional presses, the first straight-through and the second reverse. A rope carrier is provided to carry the sheet from the first press felt through the marker, the second press and on to the receiving dryer. This carrier may be shut down when not in use.

Total cost of the installation — including auxiliary equipment — will be well over $500,000.

Owens-Illinois Defends Nat. Container Merger

In an answer filed recently in the United States District Court at Toledo, Ohio, Owens-Illinois Glass Co. has denied that its acquisition of National Container Corp. violated anti-trust legislation.

The O-I denial was in response to a suit filed last December by the Anti-trust Div. of the U. S. Department of Justice, which sought to compel Owens-Illinois to divest itself of National Container properties.

Instead of lessening competition, the glass company declared, its acquisition of the paper firm will stimulate and increase competition in products made by both companies. In the merger O-I sought to diversify its operations by engaging in the production of pulp, paper, board, shipping boxes and multiwall bags, all of which are naturally complementary to the manufacture of glasswares.

New Brunswick to Double Attack on Budworm

The attack on the spruce budworm in the forests of New Brunswick is to be taken up with renewed vigor this year. Private industry in cooperation with the provincial government has decided to:

1. Spray 5,000,000 acres, more than double the 1956 total.
2. Use 190 aircraft (100 more than last year) from 14 airfields.
3. Use 2,500,000 gal. of insecticide.

The work is to be carried out by Forest Protection Ltd., a cooperative group that has organized the successful efforts of the past six years.

Canco-Dixie Merger Approved by Directors

A proposal for merging Dixie Cup Co. of Easton, Pa., with American Can Co. of New York, N.Y., has been approved by the respective

News of the Industry . . .

boards of directors. Dixie Cup shareholders were to meet early in June to vote on the proposal. (As Canco will use previously authorized but unissued common stock for the acquisition, it is not necessary to call a special meeting of American Can stockholders.)

The plan calls for the acquisition by Canco of all the assets of Dixie and its five subsidiaries. The Easton firm is the country's leading producer of paper food and drinking cups and operates eight plants in the United States and Canada. It also designs and produces its own manufacturing equipment.

The acquisition will carry Canco into the consumer product field for the first time. Metal and fiber containers now made by the firm, as well as plastic tubes and bottles and collapsible metal tubes made by its recently acquired subsidiaries, are all sold to packers and canners.

Weyerhaeuser Merges Kieckhefer and Eddy

The merger of Kieckhefer Container Co. and Eddy Paper Corp. into Weyerhaeuser Timber Co. has become effective with the approval of the stockholders of the three firms.

Kieckhefer-Eddy facilities, which include shipping container and milk carton plants throughout the nation, are to be operated as the Kieckhefer-Eddy Div. of Weyerhaeuser.

In a recent statement, F. K. Weyerhaeuser declared, "The action puts the timber company directly into the end-product container business for the first time . . . . In terms of Weyerhaeuser's forest resource policy to provide and utilize a continuous forest crop efficiently and completely, the Kieckhefer-Eddy move is an effective step toward attaining full crop utilization."

Will Break Ground for Japanese Mill Project

Construction is expected to get underway this summer for the proposed pulp mill of Alaska Lumber & Pulp Co. Inc. The plant will be located in Alaska's Sawmill Creek region, about 6 miles southeast of Sitka. (Alaska Lumber & Pulp is a wholly owned subsidiary of Alaska Pulp Co. Ltd. of Tokyo.)

Both Japanese and American sources will finance the $55,500,000 project.

The magnesium oxide process is to be employed. Production of viscose grade (93 Alpha) pulp will average 340 tons per 24 hours. Capacity for acetate grade (96 Alpha) pulps will be approximately 300 tons per 24 hours.

The United States Forest Service has granted a contract for 5.25 billion ft. of timber in the Sitka area which will be cut on a sustained-yield basis.

Stevenson & Rubens, Seattle consulting engineers, will design the plant under the supervision of Harold D. Cavin, chief engineer for Alaska Lumber & Pulp. Construction will be by Sitka Pulp Mill Builders, a joint venture of Howard S. Wright Co. and Guy F. Atkinson Co.

Recent Expansions in the Industry

S. D. Warren Co.
has announced in Boston that it is reducing operations for what it believes will be a temporary period. Affected are plants at Cumberland Mills, Maine, and Muskegon, Mich. The firm produces fine papers. A slow-down in demand has been cited as the cause.

Pollock Paper Corp.
is expanding its operations at two locations on the West Coast. The firm recently announced the beginning of construction at San Jose, Cal., of "America's most modern waxed paper plant". At the same time, Pollock reported that the installation of new equipment is underway at Seattle (formerly Pacific Waxed Paper Co.). Equipment specially designed by Pollock engineers for the production of opaque and transparent packaging materials is to be installed at both locations, including high-speed, high-fidelity presses for the precision printing of up to eight colors.

A. George Schulz Co.
of Milwaukee has purchased the equipment and inventory of Andre Paper Box Co.'s plant in the Wisconsin city. Production comprises six-pack beer carriers. (Andre's main office is in San Francisco, with the plant located at San Leandro, Cal.)

East Texas Pulp & Paper Co.
is completing a new office building

at the Evadale, Texas plant. The one-story 8000-sq. ft. structure will be completely air conditioned.

Olin Mathieson Chemical Corp. has announced the formation of Olin Mathieson International Corp. as a wholly owned subsidiary. Operations will include the production and marketing of Squibb medicinals and pharmaceuticals, industrial and agricultural chemicals, sporting arms and ammunition, non-ferrous metals and cellophane and paper packaging products.

North Western Pulp & Power Ltd. has announced that its recently-completed bleached sulfate pulp mill at Hinton, Alta., has entered production. The $42,000,000 plant designed to produce 430 daily tons is a joint venture of St. Regis Paper Co. and North Canadian Oils Ltd.

Scott Paper Co. has purchased an additional 73,000 common shares of British Columbia Forest Products Ltd. The transaction leaves a balance of 657,000 shares to be taken up by December 31 under an agreement calling for the purchase of 1,000,000 shares at $15 each.

International Paper Co.'s proposed corrugated shipping container plant at Fond du Lac, Wis., will cost approximately $1,000,000. The facility will cover about 80,000 sq. ft.

Potlatch Forests Inc. at Pomona, Cal., will install two 43-ton generating boilers at a cost of $100,000. The over-all expansion program now underway at the mill will double daily capacity to about 200 tons.

Powell River Co. Ltd. has reported that its capital investment program for 1957 will total $7,000,000. (No action is planned on the proposed Kitimat pulp mill—a joint venture with Aluminum Co. of Canada—because of excessive capital costs.)

Scott Paper Co. has completed plans to discontinue all production at the South Glens Falls, N. Y. plant of its subsidiary, Marinette Paper Co., following a study revealing that operation is no longer economically sound. The parent firm is considering the possible transfer of production equip-

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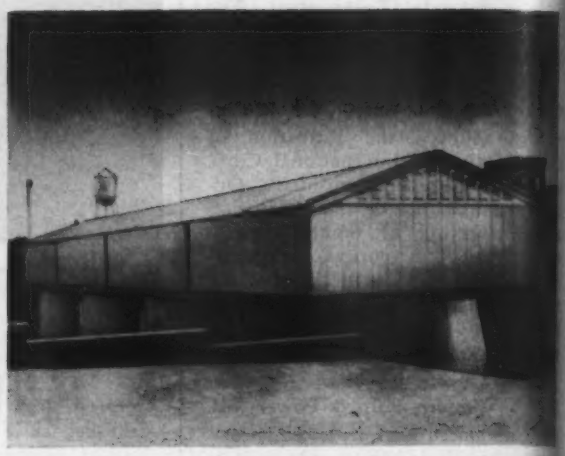


BEFORE AND AFTER—When round wooden roofs covering four concrete saveall tanks failed and required maintenance every two years, Oxford-Miami Paper Co. set out to find a solution. Moisture rising from the whitewater was determined to be the cause of deterioration. The problem was solved when the West Carrollton, Ohio firm replaced the wooden roofs with an Armco steel building 24 ft. wide by 96 ft. long. The panels were fabricated from aluminized sheet steel, a corrosion-resistant material.

ment from South Glens Falls to the plant of Westminster Paper Co. Ltd. in New Westminster, B. C., in which company Scott is a major stockholder. (The shut-down in no way affects operations at Marinette's larger plant in nearby Fort Edward, N. Y.)

West Virginia Pulp & Paper Co. will construct at Tyrone, Pa., a small plant for the manufacture of wood particle board for use in the furniture, woodworking and building industries. If the semi-experimental plant proves successful, West Virginia will give serious consideration to further investment.

Federal Paper Board Co. Inc. has acquired for cash Frankenberg Bros. Inc., folding carton manufacturer at Columbus, Ohio.

Allied News Briefs

Paper Converting Machine Co. was scheduled to complete transfer to its new plant at Green Bay, Wis., about June 1. The $1,000,000 plant occupies a 16-acre tract and will have 76,000 sq. ft. of floor space.

Joseph T. Ryerson & Son Inc. has announced an expansion program at its Pittsburgh, Pa. steel service plant. Construction will begin this year, with completion in 1958. Cost is estimated at $1,000,000.

Stickle Steam Specialties Co. has made notice that its plant will be closed from June 24 to July 7 for annual vacation.

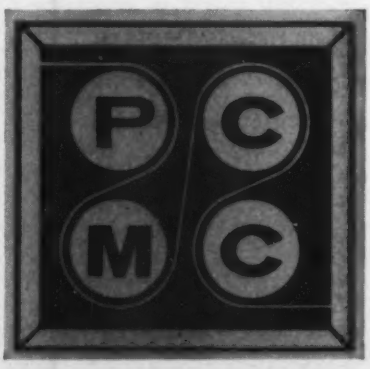
Cameron Machine Co. has been given the distributorship for Tidland pneumatic shafts. Exclusive rights have been granted by Tidland Machine Co.

Trionics Corp. has established a new laboratory in Madison, Wis., which offers research and development services on a contract basis to both industrial and government sponsors.

D. J. Murray Mfg. Co., which recently made purchase of a 160-acre tract at Stettin, Wis., has made plans for a new plant at this site.

Dow Chemical Co. has scheduled March 1958 as the date for the completion of a second synthetic glycerine plant at its Texas Div., Freeport.

Directors of **E. D. Jones & Sons Co.** have rejected a final offer from Textron Inc. of Providence, R. I., to purchase the Pittsfield, Mass. manufacturer of papermaking machinery. Textron had agreed as a condition of sale to build a new Jones plant at a cost of between $2,000,000 and $3,000,000.



THIS NEW company symbol has been adopted by Paper Converting Machine Co. of Green Bay, Wis. The adoption of the new trade mark has been coordinated with Paper Converting Machines' move into its new 76,000-sq. ft. plant. (See item above.)

Hubinger Co. has given to Western Michigan University a new $500 scholarship for use of students in WMU's department of paper technology.

Coming Events

Tappi

June 14-15—New England Section (annual meeting), Magnolia, Mass.

June 21-22—Maine-New Hampshire Section, Hotel Samoset, Rockland, Maine

July 8-19—Sixth Annual Course on the use of Statistical Methods in the Paper Industry (co-sponsored by the Technical Section of CPPA and the Department of Chemical Engineering of the University of Washington), University of Washington, Seattle

Sept. 11-13—Eighth Testing Conference, Hotel Shoreham, Washington, D. C.

Superintendents Association

Aug. 29-31—New York-Canadian Div., Saranac Inn, Upper Saranac Lake, N. Y.

Sept. 13-14—Northwestern Div., Hotel Duluth, Duluth, Minn.

Sept. 19-21—Northeastern Div., Poland Spring House, Poland Spring, Maine

Other meetings

June 13-15—Instrument Society of America, Third National Symposium on Instrumental Methods of Analysis, University of Chicago, Chicago

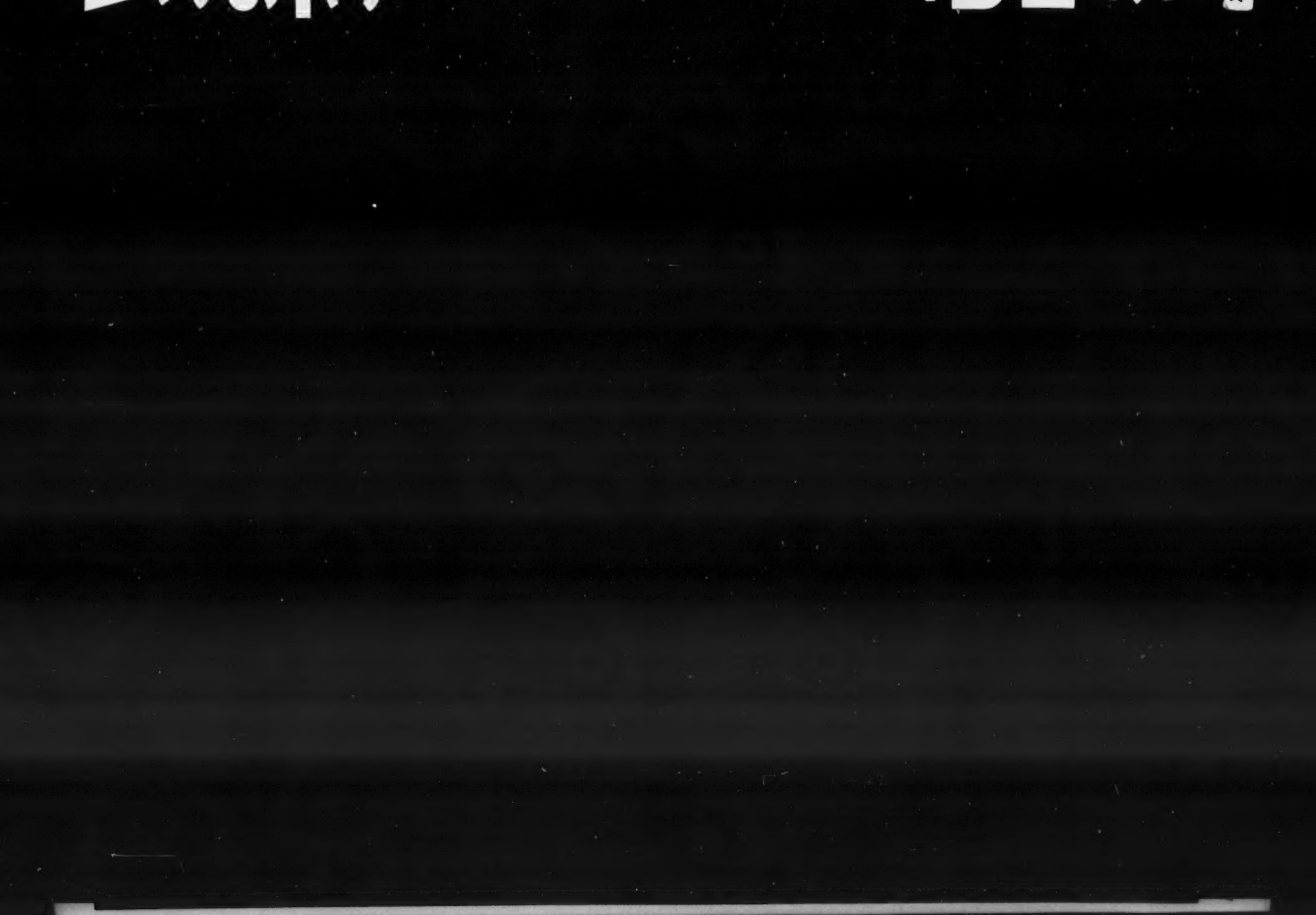
June 16—Second Industry Seminar, Institute of Paper Chemistry, Appleton, Wis.

June 16-19—Canadian Paper Box Manufacturers Association, Chateau Frontenac, Quebec City

June 17-21—American Society for Engineering Education, Cornell University, Ithaca, N. Y.

June 23-28—Forest Products Research Society (annual meeting), Hotel Statler, Buffalo, N. Y.

Sept. 9-13—Instrument Society of America, 12th Annual Instrument Automation Conference and Exhibit, Cleveland Auditorium, Cleveland



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gives you operational savings,
makes for more uniformity of your paper
or board. There are *many* other reasons
for standardizing on Hamilton Felts.
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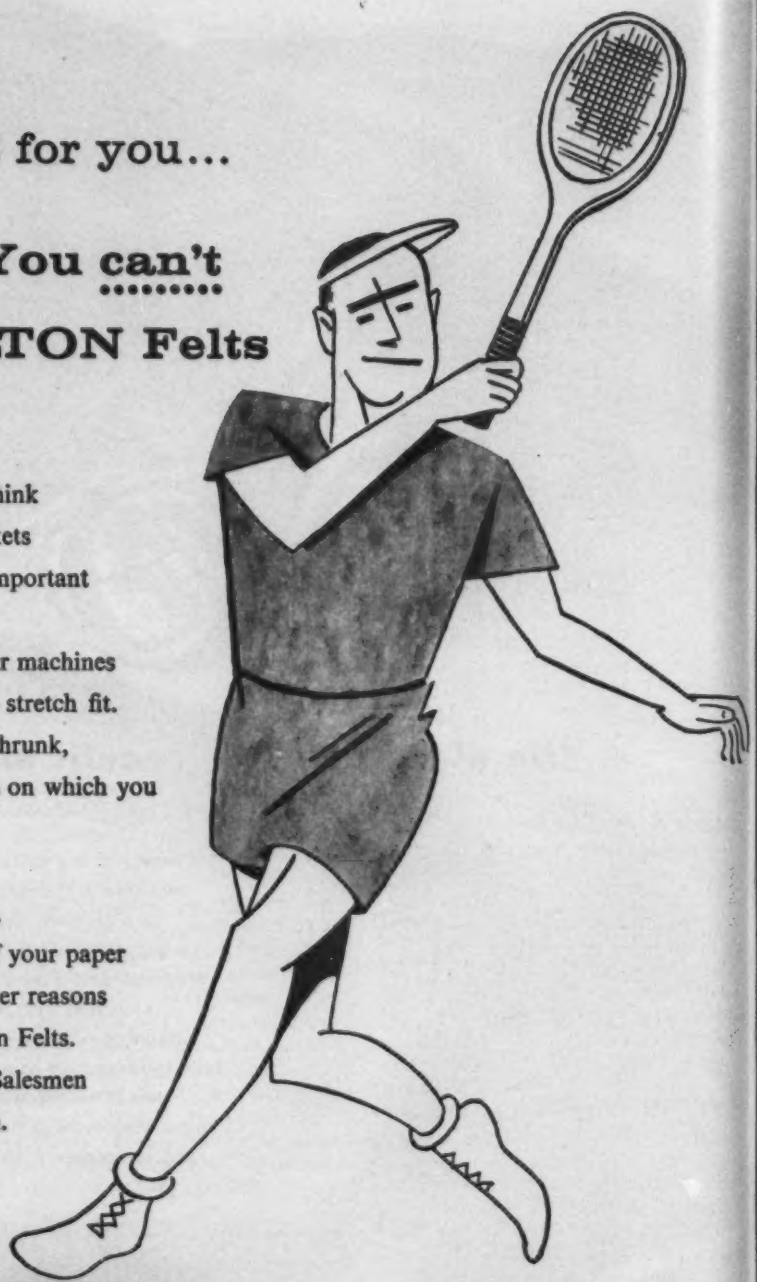
will be happy to explain them.



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NAMES in the NEWS

J. W. Warner

Archie Colby

Gulf States Elects Warner President

Jack W. Warner has been elected president of Gulf States Paper Corp. in Tuscaloosa, Ala., to succeed Mrs. Mildred W. Warner.

Formerly executive vice president and treasurer, Warner continues his duties as treasurer, while the office of executive vice president has been discontinued.

At the same time, it was announced that Archie Colby has joined the Gulf States staff as industrial engineer. He was formerly general sales manager for Greer Hydraulics Inc. and at one time was senior associate in the management consulting firm of Bruce Payne & Associates.

Dryden Appoints

Dryden Paper Co. Ltd. in Dryden, Ont., has named J. W. Wing general manager and member of the board of directors. At the same time, David Young and R. J. Chambers were elected to the board.

A graduate of Queen's University, Wing was formerly vice president and general manager of Gaspesia Sulphite Co. Ltd. He has also been associated with Anglo-Newfoundland Development Co. Ltd. and Anglo-Canadian Pulp & Paper Mills Ltd. and at one time was associated with International Nickel Co. He is chairman of the Technical Section of the Canadian Pulp & Paper Association.

Young is secretary-treasurer of Dryden Paper, while Chambers is assistant chief engineer of the General Engineering Div. of Anglo-Canadian Pulp & Paper Mills.

In other Dryden appointments, E. G. Macdonald has been named development engineer and Alec Glen chief engineer.

A veteran of 20 years with the firm, Macdonald has been chief engineer since 1944. Glen was at one time associated with Gaspesia Sulphite and in 1955 came to Dryden as project engineer.

J. W. Wing

T. G. Williams

NY & Penn Promotes Williams to Supt.

Thomas G. Williams has been appointed superintendent of New York & Pennsylvania Co.'s mill in Lock Haven, Pa. He succeeds the late Frank J. Flaig.

A graduate of the New York State College of Forestry, Williams has been associated with New York & Penn since 1938. Since 1950 he has been assistant superintendent.

Champion Names Robertson Jr.

Reuben B. Robertson Jr. has been elected president of Champion Paper & Fibre Co. to replace his father, who resigned that office but remains board chairman.

Robertson Jr. occupied the post of deputy secretary of defense from August 1955 until his resignation on April 25 of this year. He was president of Champion from July 1950 to July 1955, when he took the government post.

Scott Advances Blessing

George F. Blessing has been named plant manager of the Winslow, Maine mill of the Hollingsworth & Whitney Div. of Scott Paper Co.

Coincident with this move, Albert N. Garrett, plant manager at South Glens Falls, N. Y., was appointed to the newly created position of assistant plant manager for production at Winslow.

Roderick H. Sears, plant manager at Fort Edward, has been placed in charge of the management of the South Glens Falls mill in addition to his present duties. And Paul E. Rogers, production manager at Winslow, becomes assistant plant manager there in charge of services.

J. D. Patterson has been named vice president and general traffic manager of Union Bag-Camp Paper Corp. He joined Union Bag in 1939 and served as general traffic manager since 1940.

J. D. Patterson

Stephen Chase Jr.

Four men have received promotions in the management group at Champion Paper & Fibre Co.'s Texas Div. in Pasadena: **Stephen Chase Jr.**, former production manager, becomes assistant general manager; **R. L. Betts** succeeds Chase as production manager; **John O. Parrott** becomes assistant production manager for operations, and **Odell Sanders** chief of the process control staff.

William M. Allin, formerly division sales manager, has been elected a vice president of Continental Can Co. Inc. and placed in charge of the Containerboard & Kraft Paper Div.

Oscar O. Eggebrecht, manager of the Wausau Div. of Marathon Corp. and its predecessor company since 1924, has retired after 40 years of service with the firm. He joined Marathon in 1917 as an office boy and truck driver. Succeeding Egge-

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brecht is **Henry A. Shannon,** formerly manager of Marathon's plant at Sunnyside, Wash., and for the past eight months assistant manager at Wausau.

Aytch P. Woodson, president of Mosinee Paper Mills Co., has been elected to the newly created position of chairman of the board. Succeeding him as president is **Norman S. Stone,** vice president since 1937; while **C. M. Green,** general manager, becomes vice president.

Wilson Harvey, John Legh-Jones and **Richard G. Wace** have been elected vice presidents of Flintkote Co. Harvey is general manager of the Pioneer Div.; Legh-Jones managing director of Industrial Asphalts Co. Ltd., European subsidiary, and Wace is general manager of Flintkote Co. of Canada Ltd.

Dr. W. R. Haselton has been elected vice president for operation of Rhinelander Paper Co. in Rhinelander, Wis. He was formerly mill manager.

W. R. Haselton

Dr. G. A. Richter

Dr. George A. Richter, research consultant for Brown Co. in Berlin and Gorham, N. H., has been awarded the honorary degree of doctor of technology by the Chalmers Technical Institute of the University of Goteborg in Goteborg, Sweden. Dr. Richter, who becomes the second American to be so honored, served as director of research for Brown from 1919 to 1940, during which time he pioneered in all present techniques of producing highly purified pulps from both sulfite and sulfate bases. He also developed the first sulfite pulping of hardwoods and their use in dissolving grades, the first use of free chlorine and alkali-buffered bleach, high-brightness bleached kraft and sulfate alpha grades.

Frederick Kranzler, who had been associated with the firm 28 years, has retired as chief chemist of Continental Paper Co., Ridgefield Park, N. J.

Archibald D. Fraser, assistant treasurer since 1951, has been appointed insurance manager for Mead Corp. Prior to joining the Mead organization in 1948, he had been associated with Fraser Companies Ltd.

E. L. McCammon has been named control supervisor and **Gordon Graham** wood room superintendent at the Kenora, Ont. mill of Ontario-Minnesota Pulp & Paper Co. Ltd.

George M. Jemison, since 1954 director of the California Forest & Range Experiment Station, has been named deputy assistant chief for research of the United States Forest Service.

Morlan J. Grandbois, marketing coordinator for St. Regis Paper Co. in New York, N. Y., has been appointed director of the Forest Products Div. of the Business & Defense Services Administration in the U. S. Department of Commerce.

Dr. Klaus W. Rosenfeld, holder of a Ph.D. from the Technical University of Darmstadt in Germany, has been named director of research for West Virginia Pulp & Paper Co. at Covington, Va. He was formerly with the Swiss firm of Escher Wyss Co., designers and manufacturers of papermaking machinery.

H. A. Paterson has been named to succeed **Robert Gascoigne** as general superintendent of Mersey Paper Co. Ltd. in Liverpool, N. S. Gascoigne continues with the firm as a consultant on a part-time basis. **I. H. Pottle** succeeds Paterson as assistant general superintendent.

Vernon L. Tipka has resigned as vice president and general manager of St. Lawrence Paper Corp. in Norfolk, N. Y.

Allied Personalities

R. K. Blackburn, formerly an erecting engineer, has been named northeastern sales service representative for Beloit Iron Works. His headquarters will be in Portland, Maine.

Frank H. Crymes, formerly manager of the Chicago district, has transferred to the Wilmington, Del. plant of Hercules Powder Co., where he will serve as manager of sales training for the Synthetic and Cellulose Products departments. He has been replaced in Chicago by

Names in the News . . .

B. J. Dougherty, most recently manager of the St. Louis district. **James J. Antonak** moves from Chicago to the St. Louis office as technical sales representative.

Dr. Wilson M. Compton, founder and former president of Timber Engineering Co. and American Forest Products Industries Inc., has been elected to the previously unfilled position of chairman of the board of Cameron Machine Co. **Edgar Jadwin,** secretary of Cameron, was named vice president for administration. And **Martin Pollock,** controller, was elected treasurer.

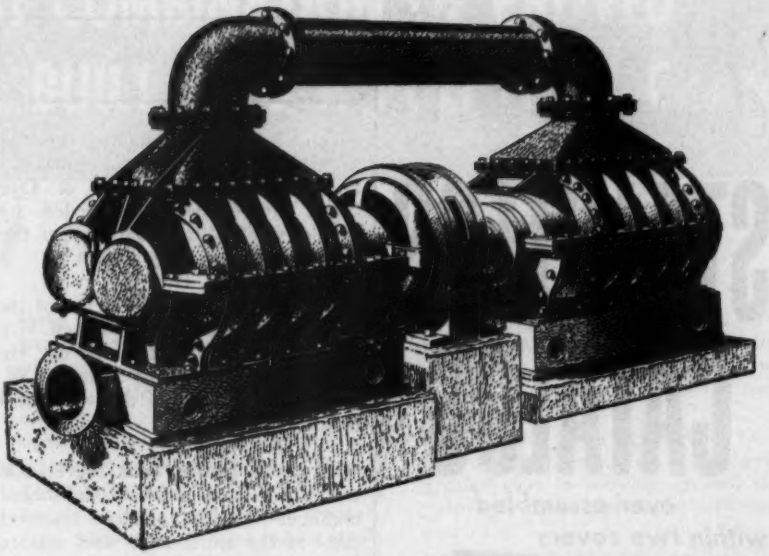
Fred M. Pugh of Cleveland has been named sales manager of the Special Commodities Div. of General Mills. His immediate assignment is supervision of guar sales.

Albany Felt Co. has announced three staff appointments: **Larry Brown,** formerly with St. Regis Paper Co. at Kalamazoo, Mich., has been named service engineer at Albany, N. Y.; **Frank McGrath,** a member of the Albany Felt staff since 1953, becomes sales engineer in Tennessee, Virginia and North Carolina, and **Robert Gordon,** at one time quality supervisor and maintenance supervisor for National Gypsum Co., has been named sales engineer in Illinois and Indiana.

Dr. D. G. Braithwaite, J. L. Giboney and **H. R. Powers** have been elected directors of National Aluminate Corp. They are vice presidents in charge of the firm's Catalyst, Transportation and Industrial divisions respectively. At the same time, two appointments to vice presidency were also announced: **Dr. J. W. Ryznar,** technical director in charge of general research and development, and **H. W. Spaght,** manager of the General Chemical Mfg. Div.

Odd H. McCleary, vice president and general manager and senior vice president of the Canadian subsidiary, has been elected president of Mathews Conveyor Co. of Ellwood City, Pa. At the same time, **L. T. Sylvester,** president since 1952, was named chairman of the board.

James P. Farrell, for the past seven years sales manager for heavy



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Names in the News . . .

chemicals, has been named director of sales for the General Chemical Div. of Allied Chemical & Dye Corp. He is being succeeded by **Frank N. Stradling,** manager of the Chicago office.

Joseph W. Greene, director of industrial sales, has been named vice president for sales of Crane Co. He is being succeeded by **Charles W. Lovelace,** manager of the valve and fitting department.

James E. Burke, sales representative at Chicago, has been appointed manager of alloy and stainless steel sales at the Pittsburgh steel service plant of Joseph T. Ryerson & Son Inc.

Four new vice presidents have been named by the William Powell Co. of Cincinnati: **George V. Mueller,** at one time with Procter & Gamble Co.; **V. Anderson Coombe,** former assistant to the president; **John A. Parlin,** with Powell since 1942, and **Russell G. Smith,** chief engineer at William Powell's plant No. 2.

Richard D. Ayers, at the Chicago general sales office since October 1956, has been assigned to the Chicago sales office of Chicago Bridge & Iron Co.

James S. Anderson, formerly general sales manager of the Tubular Products Div., has been named divisional vice president in charge of sales by the Babcock & Wilcox Co. At the same time, **Vincent R. Barrord,** a sales engineer at Alliance, Ohio, was made manager of development sales for welded tubing.

Roy L. Rollins, manager of personnel and labor relations, has been elected a vice president of A. E. Staley Mfg. Co. And **Dr. Thomas F. Protzman,** formerly with Rohm & Haas Co., has joined A. E. Staley as leader of the evaluation group in the research division.

Joseph H. Reid, a vice president, director and member of the executive committee, has been appointed general manager of the Titanium Div. of National Lead Co. **Graham W. Corddry,** assistant divisional manager, succeeds Reid as manager. At the same time, it was announced that **Leo L. Lewis** has been appointed production manager of the division to succeed C. Y. Pfoutz, who has retired. Replacing Lewis as plant manager at Sayreville, N. Y., is **Earl H. Schwartzkopf.**

Recent managerial appointments by Joseph T. Ryerson & Son Inc. include: **Harry A. Zahn,** alloy steel sales at Philadelphia; **H. Daniel Robb,** national product manager; **John Cattanach Jr.,** tubular products and cold finished bar sales at Buffalo.

C. William Converse, for eight years manager of the Pulp & Paper Mill Div. of Sprout, Waldron & Co. Inc., has been named a director of Black-Clawson International Ltd. and of Lyddon & Co. Ltd. of London.

Alexander N. McFarlane, vice president and general sales manager for Corn Products Refining Co., has been elected president of Corn Products Sales Co.

Nathaniel Brewer, vice president for research and development for Fisher & Porter Co., becomes vice president in charge of technology and chairman of the executive committee.

E. C. Wilson, associated with the firm since 1942, has been elected vice president of Illinois Gear & Machine Co.

I. E. Boberg, chief engineer for Chicago Bridge & Iron Co., has been elected a vice president. . . . At the same time, **Cecil Wooten,** associated with the export department in New York, N.Y., was named managing director of Chicago Bridge Ltd. of London.

George S. Herbert, vice president in charge of manufacturing, has been elected president of Patton Mfg. Co. Inc.

Paper Converting Machine Co. of Green Bay, Wis., has announced two promotions: **E. Daniel Nystrand,** chief engineer, becomes vice president in charge of engineering, and **Albert Gehrke,** assistant chief engineer, succeeds Nystrand as chief engineer.

Joseph T. Ryerson & Son Inc. has reported promotions as follows: **Hardie W. Beck,** a sales representative, has been made sales manager for the Pittsburgh steel service plant; **Milton C. Fidgeon,** a general sales

(Continued on page 278)

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- **CAST STEEL MACHINERY BASES AND MACHINERY SIDE FRAMES** give a rigid foundation that maintains shaft alignment and insures longer life and lower maintenance costs. Ball and roller bearings on high-speed shafts assure the maximum transmission of power.
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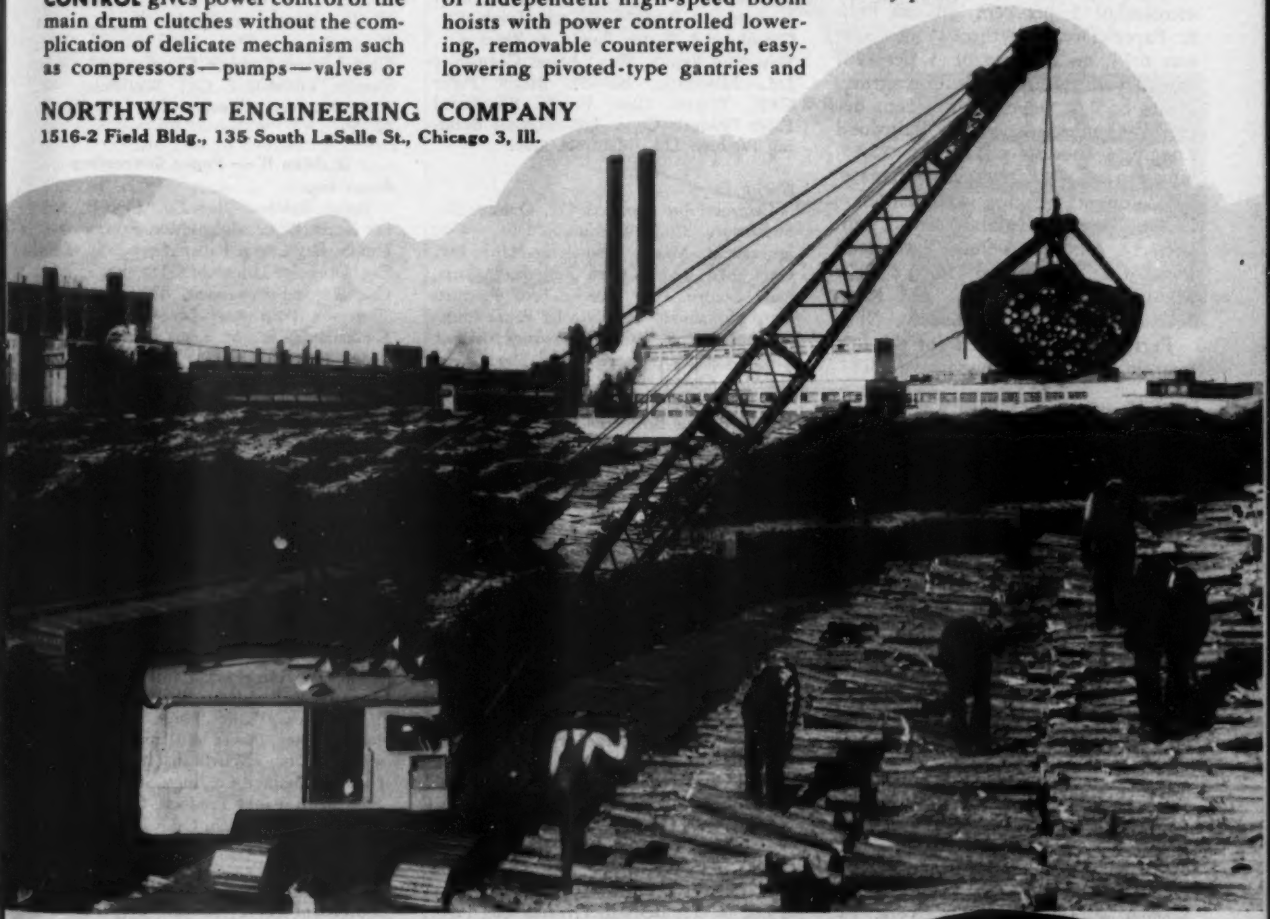

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SAFETY NEWS

First Quarter of NSC Contest Nets 224 Perfect Scores

FOR THE THREE-MONTH period of January to March, 224 of 589 contestants hold perfect scores in the 1957 Paper Industry Safety Contest sponsored by the National Safety Council. This may be compared with last year's first period record of 196 out of 539.

The January to March frequency rate for all divisions was 6.95, as compared with 6.71 for the January to March period of 1956 — a rate increase of 1 per cent. In the Pulp & Paper Div. the three-month rate was 6.73, an increase of 3 per cent from a year ago. In Paper Converting, a rate of 7.57 gave a 3 per cent decrease from a year ago. Pulpwood Logging reported a rate of 56.75, which gave a 12 per cent decrease.

Contestants working most manhours in the January to March period with perfect records were: Sutherland Paper Co., Kalamazoo, Mich.; Behr Manning, Troy, N. Y., and Kimberly-Clark Corp., Kimberly, Wis.

Perfect scores recorded for the first quarter were as follows:

Division I — Pulp and Paper Mills

Group A

Sutherland Paper Co., Kalamazoo, Mich.; Kimberly-Clark Corp., Kimberly, Wis.; Gardner Board & Carton Co., Middletown, Ohio; Nekoosa-Edwards Paper Co., Port Edwards, Wis.; Sonoco Products Co., Hartsville, S. C.; Nekoosa-Edwards Paper Co., Nekoosa mill, Nekoosa, Wis.; Price Brothers & Co. Ltd., Riverbend, Que.

Group B

Consolidated Paper Corp. Ltd., Port Alfred, Que.; Thilmany Pulp & Paper Co., Upper Mill, Kaukauna, Wis.; Flintkote Co., New Orleans, La.; Crown Zellerbach Corp., Port Townsend, Wash.; Owens-Illinois Glass Co., National Container Corp. Div., Jacksonville, Fla.; Marinette Paper Co., Marinette, Wis.; Escanaba Paper Co., Escanaba, Mich.

Brunswick Pulp & Paper Co., Brunswick, Ga.; St. Regis Paper Co., Tacoma, Wash.; Schmidt & Ault Paper Co., York, Pa.; Weyerhaeuser Timber Co., Everett Pulp Div., Everett, Wash.; LongLac Pulp & Paper Co. Ltd., Terrace Bay, Ont.; Falls Paper & Power Co., Oconto Falls, Wis.; Chesapeake Corp. of Virginia, West Point.

Group C

Rayonier Inc., Jesup, Ga.; Marathon Corp., Menominee, Mich.; Strathmore Paper Co., West Springfield, Mass.; Chillicothe Paper Co., Chillicothe, Ohio; Blandin Paper Co., Grand Rapids, Minn.; Neenah Paper Co., Neenah, Wis.; National Vulcanized Fibre Co., Yorklyn, Del.; Cornell Paperboard Products Co., boxboard mill, Milwaukee, Wis.; National Vulcanized Fibre Co., Newark, Del.

St. Regis Paper Co., Sartell, Minn.; Container Corp. of America, Wabash, Ind.; Beveridge Paper Co., Indianapolis, Ind.; International Paper Co., York Haven, Pa.; Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.; Fraser Companies Ltd., Newcastle, N. B.; Riegel Paper Corp., Warren Glen, N. J.; Fibreboard Paper Products Corp., Los Angeles; Building Products Ltd., Montreal, Que.

Group D

Central Fibre Products Co., Quincy, Ill.; Strathmore Co., Woronoco Div., West Springfield, Mass.; Congoleum-Nairn Inc., Cedarhurst, Md.; Crown Zellerbach Corp., San Leandro, Cal.; Certain-Teed Products Corp., Savannah, Ga.; Nicolet Paper Corp., West De Pere, Wis.; Crown Zellerbach Corp., Lebanon, Ore.; United States Gypsum Co., Oakmont, Pa.

Columbia Boxboard Mills Inc., Chatham, N. Y.; Bartgis Brothers Co., Ilchester, Md.; Marathon Corp., Ashland Div., Ashland, Wis.; Container Corp. of America, Ogden Div., Chicago; Certain-Teed Products Corp., York, Pa.; Fort Orange Paper Co., Castleton-on-Hudson, N. Y.; Flintkote Co., Lockport, N. Y.; Certain-Teed Products Corp., Richmond, Cal.; Celotex Corp., Los Angeles; New York & Pennsylvania Co., Willsboro, N. Y.

Mead Corp., Southern Extract Co. Div., Knoxville, Tenn.; Coos Bay Pulp Corp., Empire, Ore.; Container Corp. of America, Chattanooga, Tenn.; Fibreboard Paper Products Corp., Port Angeles, Wash.; Coos Bay Pulp Corp., Anacortes, Wash.; Spaulding Fibre Co., North Rochester, N. H.; Riegel Paper Corp., Hughesville, N. J.; Latex Fibre Industries Inc. (U. S. Rubber Co.), Beaver Falls, N. Y.

Group E

Certain-Teed Products Corp., Niagara Falls, N. Y.; Bestwall Gypsum Co., Pryor, Okla.; Mead Corp., Nashville, Tenn.; Celotex Corp., Metuchen, N. J.; United States Gypsum Co., North Kansas City, Mo.; St. Regis Paper Co., Carthage, N. Y.; Celotex Corp., Cleveland, Ohio; St. Regis Paper Co., Herrings, N. Y.; United States Gypsum Co., Galena Park, Texas; National Gypsum Co., Garwood, N. J.; National Gypsum Co., Kalamazoo, Mich.; American Writing Paper Corp., Albion Div., Holyoke, Mass.; Muskingum Fiber Products Co., Conshocton, Ohio; Flintkote Co., Mt. Carmel, Ill.; Johns-Manville Corp., Asbestos, Que.; Weyerhaeuser Timber Co., Grays Harbor Div., Cosmopolis, Wash.

United States Gypsum Co., Oakfield, N. Y.; Flintkote Co., Little Ferry, N. J.; Amalgamated Roofing Mills, Chicago; Kimberly-Clark Corp., Kapuskasing, Ont.; Robertson Paper Box Co., Inc., Montville, Conn.; Riegel Paper Corp., Riegelsville, N. J.; National Gypsum Co., Pryor, Okla.; Celotex Corp., Madison, Ill.; Fibreboard Paper Products Corp., board mill, Sumner, Wash.; Central Fibre Products Co., Denver, Colo.; Quaker Oats Co., Pekin, Ill.; International Paper Co., Livermore Falls, Maine; Celotex Corp., Avery, Ohio.

Container Corp. of America, Wilmington, Del.; Johns-Manville Corp., Tilton, N. H.; Munroe Falls Paper Co., Munroe Falls, Ohio; Rogers Corp., Rogers, Conn.; National Vulcanized Fibre Co., Marshall Bros. mill, Yorklyn, Del.; International Paper Co., Riley, Maine; Spaulding Fibre Co. Inc., Hayes plant, North Rochester, N. H.; Procter & Gamble Co., Charmin Paper Products Div., Little Rapids, Wis.; United States Gypsum Co., Gypsum, Ohio; Banner Fibreboard Co., Wellsburg, W. Va.; National Gypsum Co., Newburgh, N. Y.

Division II — Paper Converting

Paper Bags

Bemis Brothers Bag Co., Mobile, Ala.; St. Regis Paper Co., Three Rivers, Que.; Union Bag-Camp Paper Corp., St. Louis Bag Div., St. Louis, Mo.; St. Regis Paper Co., Tacoma bag plant, Tacoma, Wash.; Thilmany Pulp & Paper Co., Bag mill, Kaukauna, Wis.; St. Regis Paper Co., Dryden, Ont.; St. Regis Paper Co., Playa Ponce, Puerto Rico.

Boxes and Cartons

Group A

Container Corp. of America, Chicago, Ill.; Sealrigrt Co. Inc., Kansas City, Kans.; F. N. Burt Co. Inc., Buffalo, N. Y.; General Foods Corp., Carton & Container Div., Battle Creek, Mich.; Container Corp. of America, Anderson, Ind.; Container Corp. of America, Fort Worth, Texas; Bartgis Brothers Co., Ilchester, Md.; Container Corp. of America, Manayunk, Pa.; Fibreboard Paper Products Corp., Vernon carton plant, Los Angeles; Container Corp. of America, Rock Island, Ill.; Container Corp. of America, Valley Forge, Pa.; Consolidated Water Power & Paper Co., Ahdawagam Div., Wisconsin Rapids, Wis.; Fonda Container Co. Inc., St. Albans, Vt.; Fibreboard Paper Products Corp., Antioch carton plant, Antioch, Cal.

International Paper Co., Chicago, Ill., International Paper Co., Wooster, Ohio; International Paper Co., Springhill, La.; Fibreboard Paper Products Corp., Portland carton plant, Portland, Ore.

Group B

Northeastern Container Corp., Bradford, Pa.; Container Corp. of America, Los

Angeles; Container Corp. of America, Chattanooga, Tenn.; Container Corp. of America, Fernandina Beach, Fla.; Crown Zellerbach Corp., Gaylord Container Corp. Div., Milwaukee, Wis.; Crown Zellerbach Corp., Gaylord Container Corp. Div., Atlanta, Ga.; Crown Zellerbach Corp., Gaylord Container Corp. Div., Jersey City, N. J.; Crown Zellerbach Corp., Gaylord Container Corp. Div., Dallas, Texas; Crown Zellerbach Corp., Gaylord Container Corp. Div., Greenville, Miss.; Crown Zellerbach Corp., Gaylord Container Corp. Div., Carton Plant, St. Louis, Mo.

Mengel Co., Nashville, Tenn.; Crown Zellerbach Corp., Gaylord Container Corp. Div., Houston, Texas; Continental Can Co., Grand Rapids, Mich.; Crown Zellerbach Corp., Gaylord Container Corp. Div., Beaver Falls, Pa.; Container Corp. of America, Greensboro, N. C.; Container Corp. of America, Santa Clara, Cal.; Hoerner Boxes Inc., Sand Springs, Okla.; International Paper Co., Georgetown, S. C.; Bradley & Gilbert Co., Louisville, Ky.; Container Corp. of America, Baltimore, Md.; Hoerner Boxes Inc., Fort Worth, Texas; International Paper Co., Kansas City, Kans.; Container Corp. of America, Boston Container Div., Boston, Mass.; Hankins Container Co., Chicago plant, Chicago, Ill.

Container Corp. of America, Lake Shore Div., Chicago, Ill.; Container Corp. of America, Seattle Container Div., Seattle, Wash.; Hankins Container Co., Elmira, N. Y.; Container Corp. of America, Traver Div.; Mengel Co., Knoxville, Tenn.; Container Corp. of America, Seattle Carton Div., Seattle, Wash.; Marathon Corp. of Washington, Sunnyside, Wash.; Fort Wayne Corrugated Paper Corp., Pittsburgh, Pa.; Fibreboard Paper Products Corp., Sumner container plant, Sumner, Wash.; Fibreboard Paper Products Corp., San Francisco.

Dairypak Inc., Clinton, Iowa; Container Corp. of America, Cleveland Container Div., Cleveland, Ohio; Fibreboard Paper Products Corp., Philadelphia Container Div., Philadelphia; Hoerner Boxes Inc., Little Rock, Ark.; Hankins Container Co., Little Rock, Ark.; Marathon Corp., Newnan, Ga.; Container Corp. of America, Muskogee, Okla.; Crown Zellerbach Corp., Gaylord Container Corp. Div., Miami, Fla.; Fibreboard Paper Products Corp., San Joaquin Carton Div., Stockton, Cal.; Container Corp. of America, Sioux City, Iowa; Mott Carton & Paper Co., St. Louis, Mo.

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Johns-Manville Corp., Los Angeles, Cal.; Flintoke Co., Pioneer Div., Portland,

(Continued on page 279)

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FOREIGN ABSTRACTS

Optical studies made during cellulose solution and precipitation

During the very gradual solution of native cellulose fibers, with suitable inhibition of swelling, the formation of transversely divided and (at times) cross linked fibrils was observed. The author differentiates between "fibrils" (strands) and their component "microfibrils".

Similar strands were also observed on fractional precipitation of the cellulose from dilute solutions. The length of these beaded strands depended on the viscosity of the solution in which the cellulose had been dissolved. Various photomicrographs and electronmicrographs are given, some of them are the work of previous investigators.

The chain structure of uninjured fibrils appear to survive solution (if swelling is inhibited) and the network of these strands when regenerated very gradually from dilute solution (such as alkaline iron tartrate) are very similar with those originally present in the cell wall. They also possess an amorphous outer layer or "skin" which may be retained even after precipitation. The similarity between the strands of native fibers and those of the regenerated cellulose is also shown by the periodic constriction of microfibrils within the parent fibril.

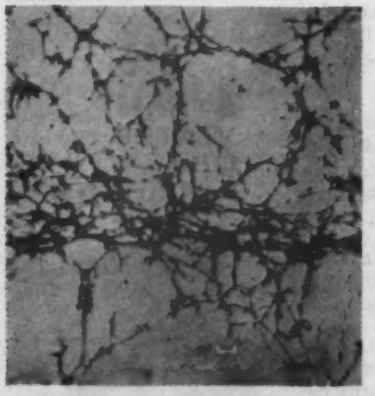


Fig. 1

Fig. 1 shows the fibrils regenerated from an alkaline ferric tartrate solution. Fig. 2 shows (in high magnification) individual fibrils, certain of which are still covered with their amorphous outer layers, which (at the point of the arrow) has been peeled off and lie near the fibril. Fig. 2 also shows the partial, initial separation into microfibrils. Both of these are electronmicrographs. The present data are compared with those of other microscopists. Typical changes were also observed, leading to

Fig. 2

conclusions regarding the behavior of fibers in the swollen state, which may serve in interpreting some of the optical micrographs.

Fifteen halftones and 18 references are given. Hans Dolmetch. *Das Papier 11*, 52-58 (1957) (in German with English and French summaries).

Spruce kraft pulps from material kept in the "biological" state

Kraft cooks were carried out systematically with sprucewood showing different degrees of swelling.

In this series, stored dried chips were used, then these same chips kept 10 days under water, freshly-felled green wood, the green wood dried 14 days in air, and the green wood kept six weeks under water, then evacuated and kept another 10 days under water. These experiments led to the discovery that there is a certain type of pulp, hitherto unreported, which is termed "biological". These pulps were formed from the freshly-felled wood, and the properties are unusual.

For example such pulps developed an extremely high folding endurance and tear resistance, especially *prior to beating*. Such strength properties were far higher than those of the usual kraft pulps. When the green wood was dried, these properties were lost.

Furthermore the "biological" pulps show another unusual property. When hydrated in a Jockro mill, at first, there is a sharp loss in folding endurance, which is only regained slowly, and in part as the pulp is beaten for longer periods. The strength properties of unbeaten fully-bleached pulps of the biological type remain very high, although not as high as those of the unbeaten unbleached material.

The authors believe that carefully prepared spruce kraft pulp, especially from fresh "biological" material, does not require extensive beating—and that the latter actually lowers the folding endurance and the tear. This is not true in the case of the breaking length or the burst, both of which increase with beating. The relationship between pulp strength and beating is discussed.

Georg Jaymé, Lisbeth Kohler, and Wilhelm L. Haas. *Das Papier* 10, 495-504 and 540-545 (1956) (in German).

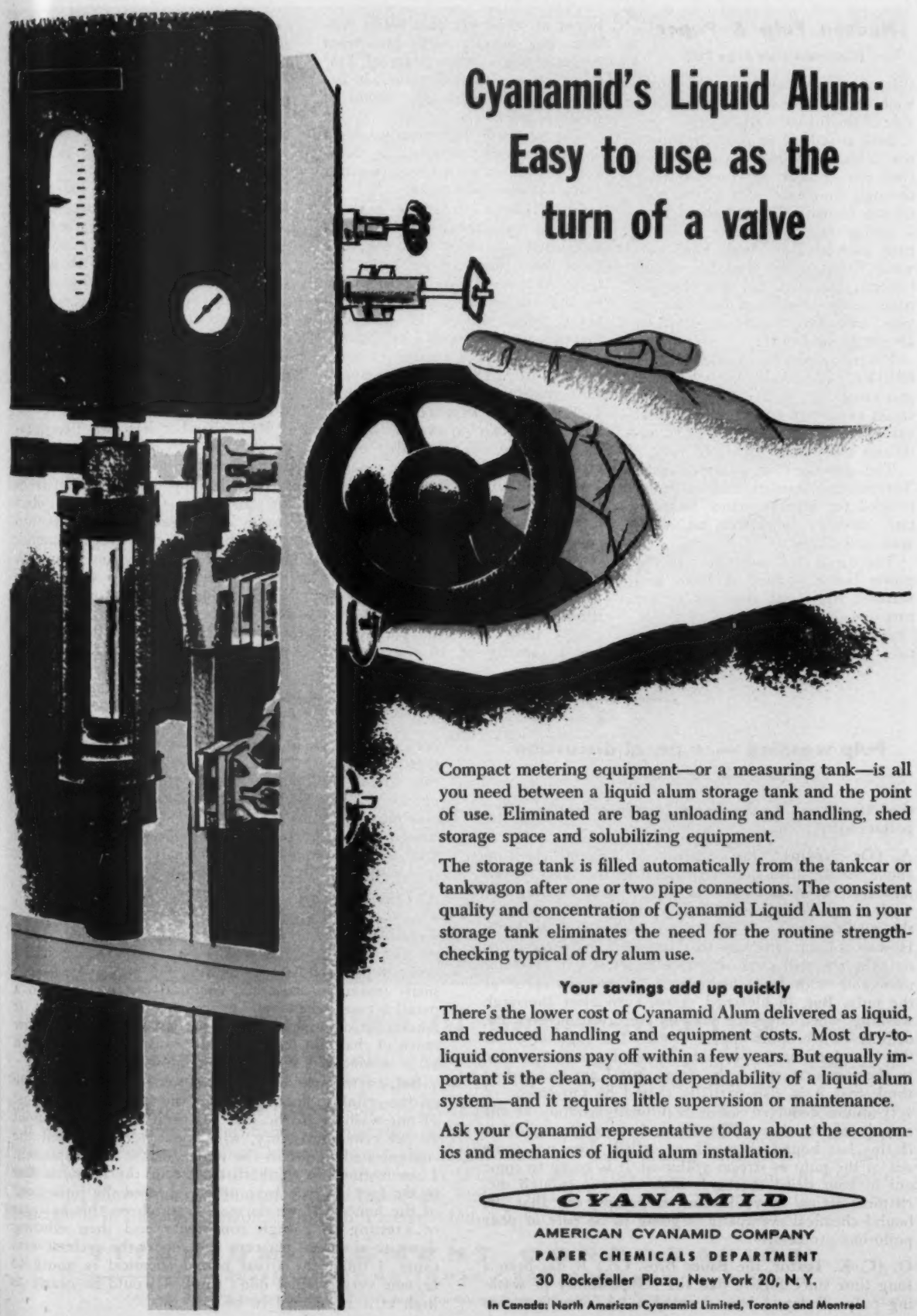
Reactions involved in parchmentization of pulp

The following three stages appear to be significant in the parchmentization of pulp by means of sulfuric acid: (a) swelling; (b) separation of the product by addition of water, and (c) the formation of membranes on drying. All of these have a physico-chemical importance and serve to characterize a successful parchmentization.

In such a process, a portion of the cellulose is rendered "mobile" and is displaced while the remainder stays as a fibrous framework. In judging the progress of a parchmentization, certain morphological properties were followed microscopically and are shown in a series of photomicrographs. The effects of reaction, time temperature and of acid concentration were studied, and the best conditions for effecting a successful parchmentization were devised.

In the case of a bleached sulfite pulp, the optimum conditions were treatment for about 10 sec. with 65.5 per cent sulfuric acid at about 10°C. Twelve very different pulp samples were examined and a certain relationship was established between analytical properties of a pulp and its successful (or unsuccessful) conversion into a parchmentized sheet. When each of these pulps was subjected to what should be the best conditions for parchmentization, it was found that those pulps which had a beta-cellulose content within the range of 4-8 per cent and a gamma cellulose content of about 5 per cent could be parchmentized readily. A very low beta-cellulose content or a very high gamma cellulose content gave unsatisfactory results. For example, a pulp containing 4.4 per cent beta and 12.1 per cent gamma cellulose proved unsatisfactory. This was also true for a pulp containing 1.4 per cent beta and 0.7 per cent gamma cellulose. The beta cellulose which separated consisted of non-fibrillated particles that were able to form coherent membranes (or films). When such particles were dissolved in acid, the general course was reminiscent of their solution in alkali.

Twenty one references are given. Hans Bucher, *Das Papier 11*, 125-133 (1957) (in German).



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Hudson Pulp & Paper

(Continued from page 217)

silicon carbon bricks in the front wall of the furnace and the front side of the bridge wall.

Bark is fed, at 50 per cent moisture content, by two variable speed fuel bin feeders into the furnace through four feedholes in the roof of the furnace. These feeders have a storage capacity of 300 cu. ft. of bark each and are built with outward flaring sides and live screw bottoms. The bark fed into the furnace forms a long conical shaped pile extending across the 18-ft. length of the hearth.

Electric power is generated in a 6250-kw non-condensing turbine generator designed for automatic steam extraction at 150 psi and final exhaust at 50 psi. Steam inlet conditions are 400 psi and 700° F.

The generator is equipped with Thermalastic insulation recently developed for high resistance to moisture, solvents, lubricating oil, weak acids and alkalis.

The metal-clad switchgear in the power house is rated at 5000v and features draw out type air circuit breakers.

A heat and chemical recovery furnace is designed to burn black liquor at 50-64 per cent solids content and develop 460 psi steam pressure and a temperature of 725° F at the superheater outlet. It has a capacity of generating 126,000 lb. of steam per hour.

The recovery unit incorporates a furnace, boiler, superheater, horizontal continuous tube economizer and a Cyclone evaporator.

The Cyclone evaporator is a carbon-steel cylindrical shell with a tangential gas-inlet for the flue gases from the recovery unit. Black liquor is sprayed into the gas stream of the tangential gas inlet. Additional black liquor is circulated through nozzles located at the top of the Cyclone to wash its walls continuously. The flue gas temperature leaving the evaporator is 300° F. The Cyclone evaporator takes the part of the cascade evaporator, and its advantage offered is that of reclaiming heat from the flue gases in order to concentrate the black liquor to 50-65 per cent solids content prior to burning it in the recovery unit.

An Airveyor system unloads the salt cake from the cars and delivers it to either a storage building or direct to the service bin of the recovery unit. The Airveyor system has a capacity of 10 tons of salt cake per hour. Air is supplied by a size 14 x 21 type RCR rotary positive displacement blower.

The flue gases from the recovery unit pass through a double chamber electrostatic salt cake recovery precipitator. Each chamber is equipped with motor-operated slide gates at the inlet and outlet ends to permit by-passing one chamber for maintenance and inspection purposes.

The precipitator is energized by a 30-kva double half wave vacuum tube rectifier equipped with an internal high-tension switchgear for grounding purposes and individual energizing of the two chambers. As a safety feature, a fool-proof key interlock prevents operators from entering the chamber until power is switched off and proper grounding carried out.

Each chamber has two precipitation zones, each of which is divided into 15 parallel gas lanes.

Dust is rapped periodically from the discharge and collecting electrodes in the gas lanes. It falls into a flat-bottom collecting chamber below the precipitation zone. A drag scraper carries the salt cake to a sluice hopper at the inlet end of the chamber. By flushing this hopper with black liquor the salt cake is transported from the precipitator.

Pulp washing — a panel discussion

(Continued from page 227)

the refiners or on the paper machines, it presents a pollution problem.

A. (Dr. Nolan) This concerns Mr. Evans' question about the 16 lb of bound chemical in the sheet. In all laboratories, in washing our pulps after cooking we wash in canvas bags by spraying hot water at 170° over the pulp for about 4-5 hrs. to insure thorough washing. However, I am quite sure that, when we dry these pulps out, there is still some washable material left. It is not noticeable with kraft because of the natural color of the pulp. But, in bleached pulps, even after thorough washing, when large size samples are dryed in the oven, definite brown spots appear around the edges. Part of this discoloration is probably caused by oxidation due to the temperatures in the dryer, but I am inclined to think that it is also partially caused by movement of very dilute dissolved solids that finally end up at the outside of the sheets. Therefore, I am quite sure that if this last bound chemical, so called, does not come out of the pulp as stream pollution, it is going to come out in your dried sheets. I think there is enough mechanical action in your refiners, pumps, etc. that the bound chemical eventually is going to be part of your pollution problem.

Q. (C. K. Textor, the Bauer Bros. Co.) It has been a long time since I have had the responsibility of washing pulp. Today, I have learned a lot. One term has been bandied about here. That is the bound soda. Is there any concept that that is a definite compound, that there is a definite amount that is tightly bound up? Or, is it merely the gradual increase in the difficulty of removal as soda concentration goes down, something similar to the difficulty in removing water as the pulp gets drier? In other words, is there a bound soda or is it soda that is more difficult to get out?

A. (Dr. Nolan) In my experience, I have found that, whenever such terms as "bound" chemical and "adsorbed" chemical are used, they might better be called, in about 75 per cent of the cases, ignorance factor. I don't think there is any question but what you have a small amount of adsorbed chemical on the fiber. In a parallel case, when you get caustic on your hands, it takes a lot of washing to get the last slip feel off. How much of that slip feel is actually caustic and how much of it is modified skin, I don't know.

But, anyway, there probably is some adsorbed alkaline on the cellulose fiber. However, the very fact that most of our washing in the past has been done up to about 20 per cent consistency, where you never touched the concentrated liquor in the lumen makes me suspicious. I am inclined to think that a lot of the blame is due to the fact that you have never squeezed the liquor out of the lumens. If we do more research on this business of pressing to a high consistency and then diluting down to about 20 per cent and repeat the cycle several times, I think the actual bound chemical is going to become very small. I don't think it would be nearly as high as it is claimed to be.

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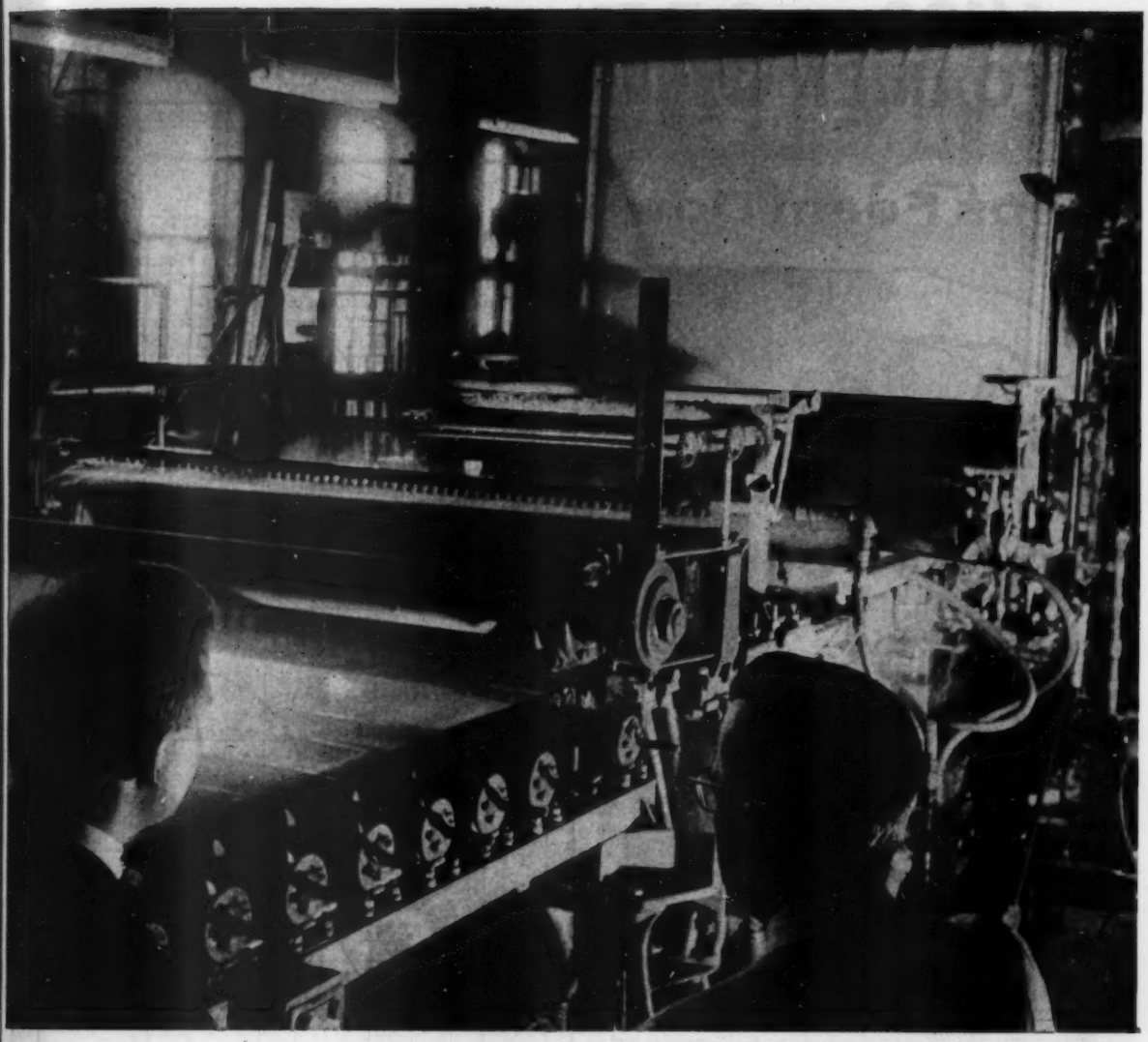

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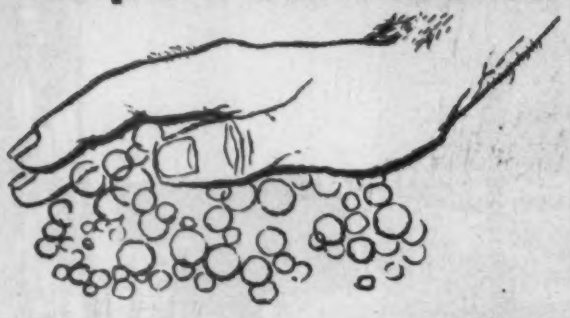

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PATENT REVIEWS

MELVIN NORD*

Bleaching of kraft pulp

U.S. 2,779,656, issued Jan. 29, 1957, to Francis L. Fennell and assigned to E. I. du Pont de Nemours & Co., describes a multi-stage process for the bleaching of kraft pulp.

The process is based on the discovery that in multi-stage processes for bleaching kraft pulp in which active chlorine agents are employed in a series of treatments and which include a intermediate caustic extraction treatment using an extracting liquor containing a peroxide, the final brightness of the treated pulp is highly dependent on the amount of alkali present in the treating liquor used in the extraction stage. It has been found that maximum final brightness is achieved when the total alkalinity of this liquor is 1.0-2.2 per cent, calculated as NaOH and based on the dry weight of the pulp. However, at least 60 per cent of the total alkalinity should be derived from an alkali metal hydroxide or peroxide.

The effect of alkalinity on brightness is shown in Fig. 1.

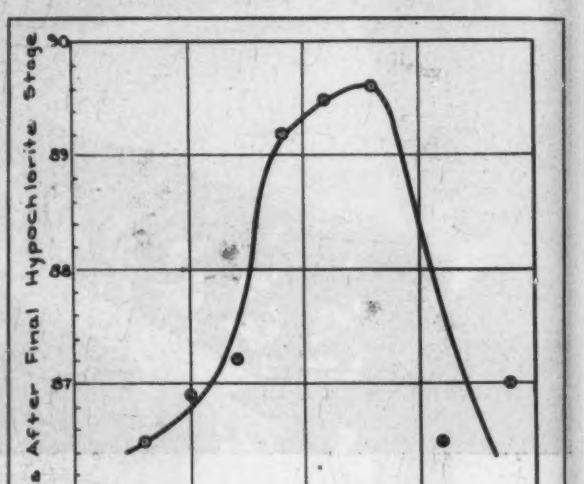

Fig. 1

Cast calendering supercalendered coated paper

U.S. 2,780,563, issued Feb. 5, 1957, to Frederick H. Frost and Robert E. Lane, assigned to S. D. Warren Co., describes a process for finishing or treating coated paper (coated on one or both sides), to produce a very high gloss and a very level surface.

As shown in Fig. 2, 1 is an unwinder which has wound around it a roll of dry, supercalendered coated paper 2, which is moved by a press roll 3 having a yielding surface such as felt or rubber, through nip 11, formed by press roll 3 and finishing drum 7 having a chromium surface. Riding roll 4 rides on press roll 3, forming nip 10 through which the coated paper passes. A continuous stream of water (with or without additives such as ammonia, surface active agents, metal wetting agents and/or formaldehyde)

*Patent attorney, 17600 Pinehurst, Detroit 21.

is flowed from the source 5 onto the entire length of the surface of riding roll 4 to maintain the surface of the riding roll wet, and thus to maintain nip 10 wet. Another stream of water from source 6 is flowed onto the entire length of the chromium surface of finishing drum 7, flooding nip 11. The wetted surface of the

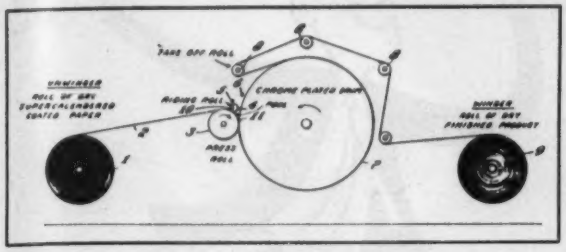

Fig. 2

coating is then pressed against the wet chromium surface of drum 7 by the press roll 3. The chromium surface of the drum is kept heated. The surface of the coating is removed from the revolving surface of drum 7 by means of take-off rollers 8 after it is dried by the hot drum surface. The dried coated paper is then rolled up on winder 9.

Paper deinking and dewaxing process

U.S. 2,776,209, issued Jan. 1, 1957 to Denis J. O'Flynn and assigned to E. I. du Pont de Nemours & Co., describes a process for the recovery of waste paper, employing a new deinking and dewaxing agent, namely, urea.

The deinking effect of urea is believed to have some relationship to its ability to form organic complexes. The dewaxing effect evidently occurs by a similar mechanism.

A neutral or slightly alkaline condition is desirable. Suitable temperatures are in the range 70-100°C. The time required for deinking is generally not more than 15 min. Frequently the dewaxing effect is incidental to deinking.

The patent describes examples of the recovery of waste magazine paper and waste waxed paper (drinking cups).

Manufacture of soft paper products

U.S. 2,778,749, issued Jan. 22, 1957 to John P. Bainbridge, Jr., and Edward S. Blake, assigned to Monsanto Chemical Co., describes a method for softening the surface of paper products such as paper towelling or facial tissue.

The method involves the addition of a water-soluble aliphatic disulfonic acid containing at least 10 carbon atoms, (e.g. the disodium salt of eicosane disulfonic acid). This agent may be applied directly to the paper after it is formed or it may be incorporated into the paper product prior to the manufacture of the paper product. A preferred mode of application is spraying an aqueous solution of the agent on the surface or surfaces of the paper product which it is desired to soften.

Production of preserved alkaline paper

U.S. 2,780,546, issued Feb. 5, 1957, to Clarence L. Moyle and Charles G. Humiston, assigned to the Dow Chemical Co., describes a method for the manufacture of an alkaline paper which is resistant to the attack of micro-organisms.

The desired result is achieved by adding to a paper pulp suspension: (1) pentachlorophenol or its water soluble salts, (2) an excess with respect to the pentachlorophenol of a long chain aliphatic amine (or salt), such as dodecylamine and (3) a paper filler. The modified pulp suspension is mixed, then diluted and formed into a paper web at a pH of 7.2-9.8. Enough of the pentachlorophenol remains in the paper to impart a resistance to attack by micro-organisms.

Continuous concentration of sulfite liquor

U.S. 2,780,281, issued Feb. 5, 1957, to Armin E. Reinert and one-half assigned to Herbert H. Clark, describes a novel process

According to medical authorities, workers in hot, oppressive plant areas are subject to "heat fatigue," which causes involuntary work slow-downs, mental depression, and, in some cases, actual illness. This means lowered production, loss of workdays, and costly employe "turnover."

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Patent Reviews . . .

for the continuous concentration of spent hot sulfite liquor delivered from paper mill digesters.

The hot liquor is first subjected to a partial vacuum to remove some of the excess water as vapor. The partially dehydrated liquor is then pumped under pressure through a refrigerator. The cooled liquor is sprayed through an orifice into an enclosed chamber, in which snow forms. The snow is mechanically separated from the concentrated sulfite liquid, is melted and then used as ice water to condense the vapor initially removed from the liquor under vacuum.

Moisture impervious container

U.S. 2,781,139, issued Feb. 12, 1957, to Lloyd G. Copeman, describes a method of producing a moisture impervious container, the walls of which are formed of a homogeneous sheet of rubber-coated paper.

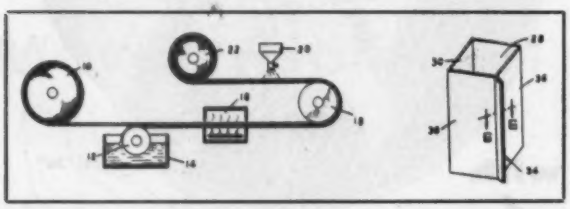


Fig. 3

Fig. 4

As shown in Fig. 3, paper stock is fed from a reel 10 over a coating roller 12 which feeds latex from a tank 14 to the under surface of the paper. The stock thus coated is carried to an oven 16 which is so regulated as not to cure the latex completely, but simply to impart to the latex coating a surface which is non-tacky but cohesive. The stock then passes over a roller 18 and under a dispenser 20 for talc or other powder, which renders the semi-cured latex surface non-adherent and noncohesive. The stock is then passed to a take-up roll 22, where it is wound up.

When the stock is ready to be made into boxes, the strip is unrolled cut and folded into the form shown in Fig. 4. The adjacent edges along the vertical seam 34 are pressed into contact. The seam seals itself tightly as soon as the surfaces are brought into contact without heat or wetting with a solvent.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Pulp refining apparatus	Sutherland Refiner Corp.	2,778,282	1/22/57
Packaging with molded pulp cushioning pads	Richard L. Emery	2,778,490	"
Divisible receptacle	Aaron Berke	2,778,522	"
Partitioned structure for compartmented cartons	Atlanta Paper Co.	2,778,526	"
Carton	Louis M. Butterfield	2,778,558	"
Blank for the packaging of books	Atlas-Boxmakers, Inc.	2,778,559	"
Collapsible box	Edward J. Pfeiffer	2,778,560	"
Mailing boxes	Olif V.B.J. Brunaa	2,778,561	"
Container closure structure	James O. Tilly	2,778,562	"
Tub beater	Lloyd T. Murphy	2,779,251	1/29/57
Adjustable slice for papermaking machine	Thomas M. Owens	2,779,253	"
Paper forming machine	Beloit Iron Works	2,779,254	"
Cartons for garments	Interstate Container Corp.	2,779,460	"
Shipping container for telcvision receivers	Bendix Aviation Corp.	2,779,463	"
Can carrier	Container Corp. of America	2,779,499	"
Toilet seat cover dispensing package	John C. Thomasma	2,779,500	"
Multi-unit container	Clarence W. Vogt	2,779,526	"
Battery shipping container	Crown Zellerbach Corp.	2,779,527	"

Do You Revel In Trouble, *Mr. Paper Maker?*

Do you just accept trouble or move to put an end to it?

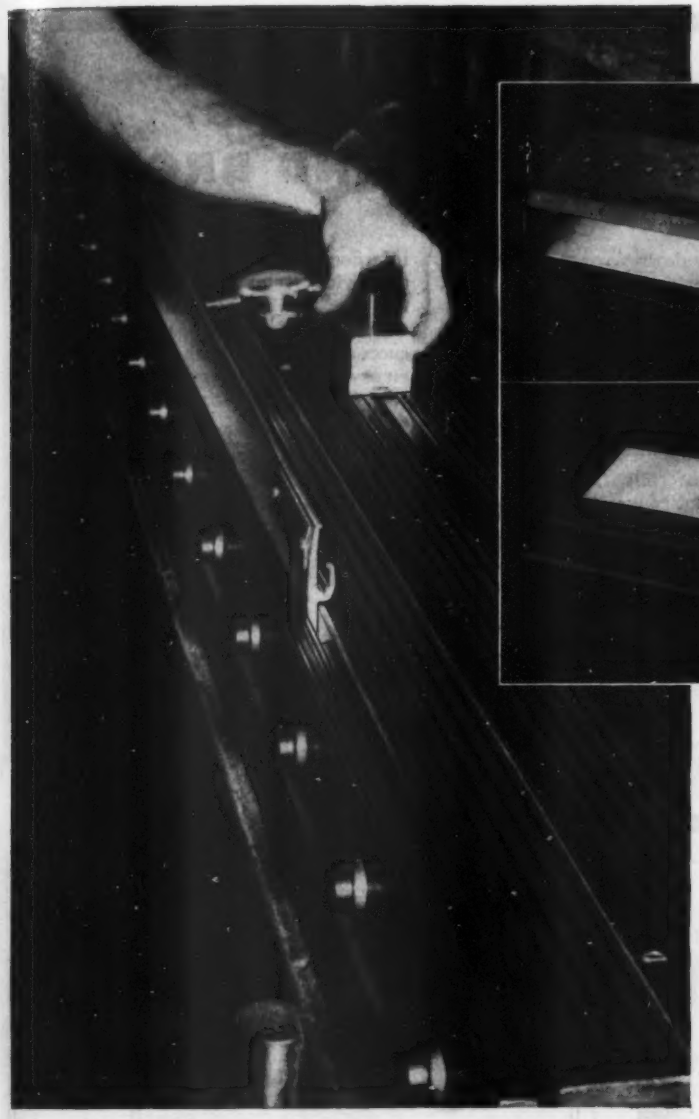
What trouble? Bacterial attack—premature holes in your felts and/or rot along the edges. If that's your trouble, you need An-Bac felts for cure—particularly so when faced with extended week-end shutdowns.

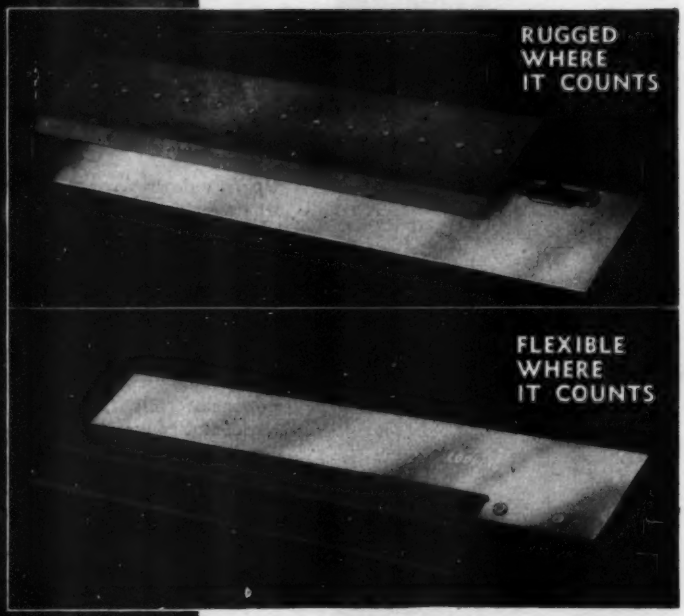
If not plagued with bacteria, perhaps chlorine, muriatic or sulphuric acid is shortening the life of your felts. If that's your trouble, Orr-Chem felts will solve the problem.

Orr

Orr-Chem chemically treated felts to resist alkaline attack.
An-Bac felts to resist acids and bacteria.
Standard felts for the more fortunate mills.

THE ORR FELT & BLANKET CO.
PIQUA, OHIO





Testing Blade Holder — straightening with precision dial indicator

LODDING FLOATING BLADE HOLDERS

Lodding K-4 Blade Holders give you accuracy in a variety of materials—

Phosphated Steel — where service is dry . . .

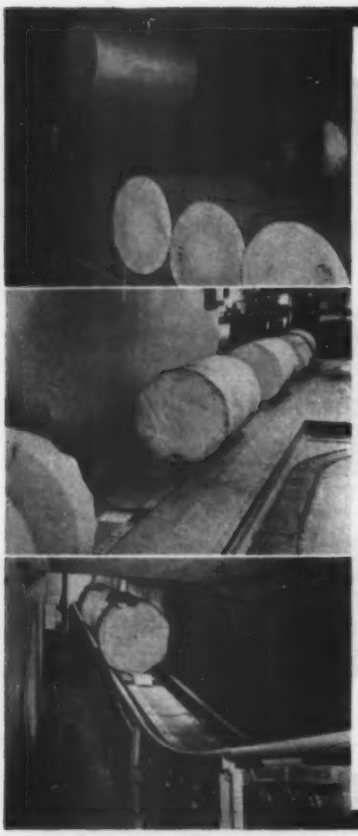
Stainless Steel — where service is wet . . .

Brass — where service is wet but not severe . . .

The Lodding machined solid bar is the ultimate in stiffness and accuracy. Springs are there to allow the blades to seat flexibly and yet are adequately protected against damage. Note the combined button and spring clip which keeps the blade firmly against the blade holder.

LODDING ENGINEERING CORPORATION

WORCESTER, MASSACHUSETTS



Prime mover for
PAPER ROLLS AND BROKE

Up . . . down . . . or horizontal—whatever your conveying problem, there's a Gifford-Wood unit or system *already in use* that comes close to meeting your problem.

For years G-W has solved big specialized handling jobs for paper mills and printing plants. Electric and pneumatic drops and lifts for newsprint rolls (top photo) . . . horizontal conveyors . . . automatic interfloor handling systems . . . and conveying systems for broke have all been built and installed by Gifford-Wood. And all are operating successfully today, with speed, efficiency, savings, and complete protection for the paper rolls involved.

Ask a good engineer about Gifford-Wood conveying systems. Then write for full details on actual G-W installations.

***Free!* Idea Book on engineered materials handling systems.**
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"WSS" WATER SEPARATOR SNUBBERS

- **Silence water-sealed vacuum pump exhausts**
- **Remove 100% of water from exhaust**

Particularly adapted to the paper mill where any content of water in the exhaust gases from vacuum pumps is costly and dangerous. The "WSS" will accommodate water having a percentage of settlings and impurities — convenient clean-outs are provided. Water is removed centrifugally and drained off at the bottom of the unit. Standardly available in sizes from 1¼" to 12". Also models to meet unusual and corrosive conditions, and sizes larger than 12".

Ask for Bulletin No. 270

BURGESS-MANNING COMPANY

777 East Park Avenue, Libertyville, Illinois

SALT CAKE

PRIOR CHEMICAL CORPORATION • NEW YORK
420 LEXINGTON AVENUE

High quality, free-flowing material available for shipment to the paper industry from strategically located points.

NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Constant level electro oilers

A constant level electro oiler now available eliminates any variation in drop feeding since the oil which feeds the sight feed valve is always at the same level.

Oilers are filled through a top filler cap. The transparent reservoirs permit a visual check of oil supply at all times. Glass reservoirs are also available for temperatures above 160° F. *Oil-Rite Corp.*

Circle No. 12 on Readers' Service Card

Motors for hydraulic pumps

A special series of motors designed particularly for hydraulic pumps are now being offered. They are available in drip-proof, totally-enclosed and explosion-proof designs.

The company invites you to send for data sheets which give further information regarding all motors in this series. *U. S. Electrical Motors Inc.*

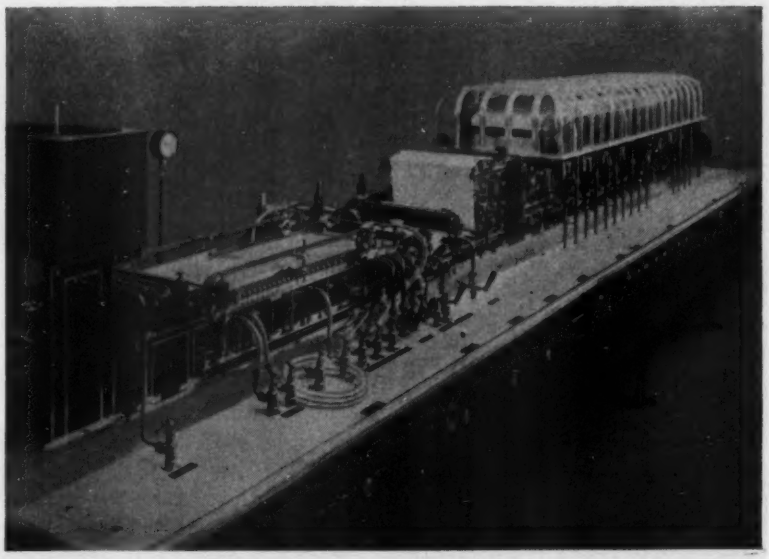
Circle No. 13 on Readers' Service Card

Fork truck with special paper roll clamps

This is the model BF Skylift electric-driven fork truck which is equipped with special paper roll clamps.

The clamps revolve in a forward direction rather than sideways. When paper rolls are set down in this fashion, they remain stationary, otherwise they have a tendency to roll or tip over. These clamps are so designed that a paper roll may be lifted, if necessary, when the clamp is able to grip less than 180° of its circumference. *Yale & Towne Mfg. Co.*

Circle No. 14 on Readers' Service Card



Midget fourdrinier paper machine

Here is a midget fourdrinier paper machine which produces paper that is only 8¾ in. wide but of a quality comparable to a full-size fourdrinier paper machine.

The machine can be used for experiments with new types of paper and to run laboratory tests without interfering with full-size machine production. It is now being used very successfully in paper plants and government laboratories.

Requiring only one operator, minimum of raw materials and floor space, it is all-electric in operation.

The unit operates under the same pressure and temperature conditions as a full-size fourdrinier and runs at speeds from 1.6 to 6.5 fpm. Over-all dimensions are 13 ft. 1 in. long by 32 in. wide. *Parsons & Whittemore Inc.*

Circle No. 11 on Readers' Service Card

Venturi tubes

Venturi tubes with stainless steel metering sections are now being produced. The designs have been created especially to make use of low-cost production methods with stainless steel.

Fig. 1 shows the standard style full venturi. This is available with flanges with plain ends for Dresser or similar coupling, or with ends beveled for welding.

Fig. 2 is the insert type for installation in users pipe. This has a full piezometer ring for throat taps with instrument connection in mounting flange.

Designs are flexible, not being limited by

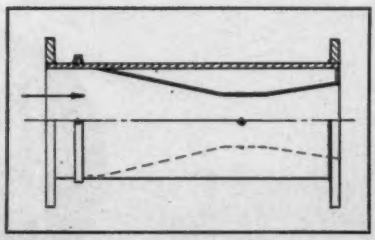


Fig. 1

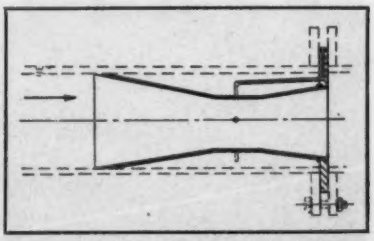
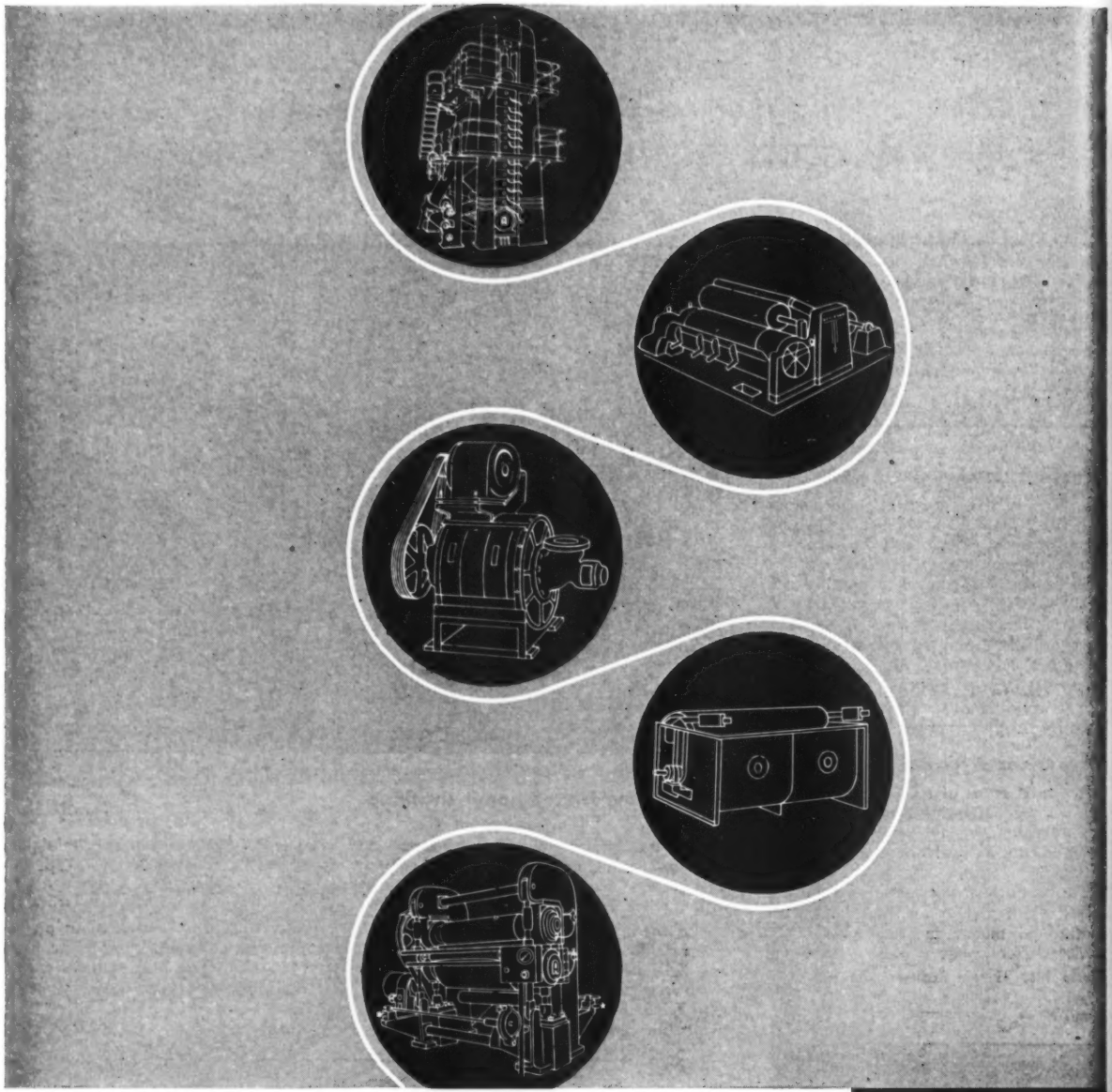


Fig. 2



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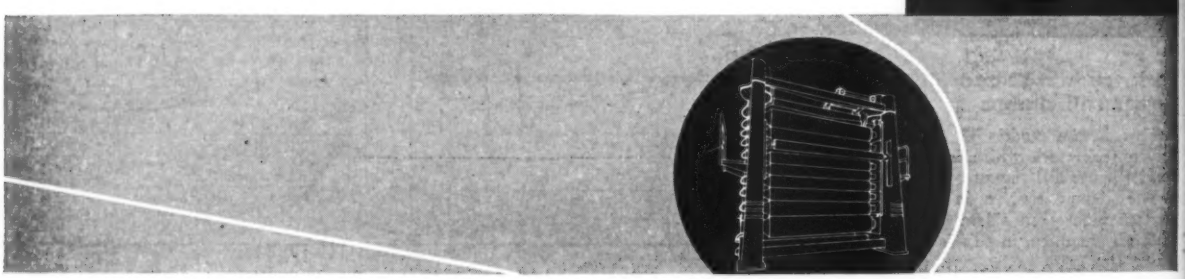
of the paper industry

APPLETON MACHINE COMPANY

Appleton, Wisconsin

Supercalenders, winders, rotary screens and gravity deckers, textile calenders, machine calenders, calender rolls, Cram Dryer Drainage System.



WILLIAMS PRECISION FREENESS TESTER

A Freeness Tester Based on Timed Drainage

The only type of instrument that will give accurate freeness tests thruout the entire range from the freest to the slowest.

No Other Instrument Has Its Versatility

1. Test Pad instantly removable for dry weight check and consistency.
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3. The only Freeness Tester that can be equipped with Recording Attachment for research work or permanent records.
4. Behavior of stock may be observed thru graduated glass cylinder during test and measured at any intermediate point.

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Most Versatile For Research — Most Practical For Control

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Pulp Testing Ovens
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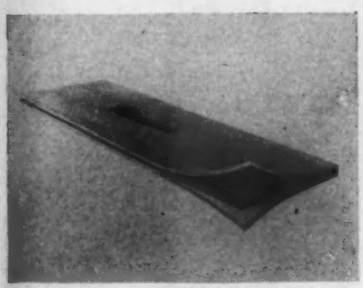
Laboratory Presses
Electric Centrifuges
Wood Chip Classifiers

New Products . . .

foundry patterns, so they can be tailored to fit any location. *Vector Mfg. Co. Inc.*
Circle No. 15 on Readers' Service Card



Plastic reinforced flat belt

A new reinforced flat belt combining the glove-like grip of leather with the super strength of plastic is now available for many types of power applications.

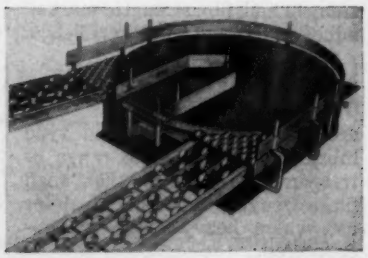
The belt consists of a plastic center (see photo above) welded to two outer plies of leather. The manufacturer states that the belt is ideally suited for paper machine belt drives because it maintains driven speed, is shock absorbing and practically free from maintainance.

The belt is sold under the name of Tanastic. *J. E. Rhoads & Sons.*
Circle No. 16 on Readers' Service Card

Double-purpose lift truck

The photo above shows a recent development in lift trucks.

For pallet-handling, the conventional fork truck is used. For roll-handling, a slender 2 1/4-in. diameter ram is inserted into the cores of the rolls. The truck has been designed for removable attachments for each type of load. The forks on the trucks elevate to 152 in. *Raymond Corp.*
Circle No. 17 on Readers' Service Card



Powered turntable

The 48-in. diameter disc turntable shown in the photo above is direct-driven by a gearmotor at 25 rpm to produce approximately 300 fpm rotation. This turntable is designed for use with powered or gravity conveyors.

Floor space required for the turntable assembly is 5 ft. x 5 ft. It is available with adjustable legs to bring the top to any prac-

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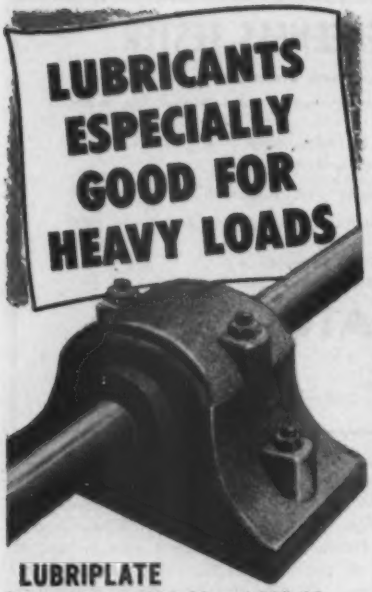
UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City



LUBRIPLATE
Nos. 130-AA, 630-AA and 930-AA
are grease type lubricants especially formulated for use in bearings and on other machine parts subject to heavy loads. Have extremely high film strength, marked adhesiveness and water repellence.

LUBRIPLATE
Nos. 4 and 8
are most satisfactory fluid type lubricants over a wide range of temperatures. Due to their high film strength, they are ideal for use where heavy loads are encountered.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

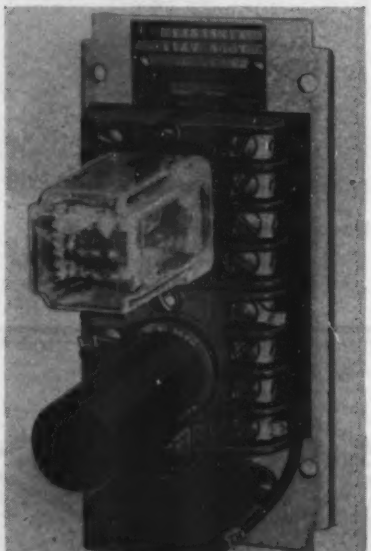
New Products . . .

tical height. It is designed to transfer packages or loads at either a 90° or 180° turn. *Samuel Olson Mfg. Co.*
Circle No. 18 on Readers' Service Card

Magnesium combination ramp-dockboard

This unit is built in two detachable sections. It is much easier to handle than heavy, extra-long dock boards normally required under these conditions. Because of this design and the weight advantage of magnesium, it is possible for a single man to move and position this type of dockboard.

Capacities up to 12,500 lbs. axle loading are available in this unit. Also the unit is available for truck-loading, or freight car-loading as shown in the above photo. *Copperloy Corp.*
Circle No. 19 on Readers' Service Card



AC sensitive relay unit

This new electronic component, designed to resist vibration, corrosion and shock, offers features which include a two-pole, double-throw plug-in relay protected by a clear polystyrene dust-proof cover; a long-life plug-in transistor amplifier and power pack module; 12-v dc sensing circuit, and a low sensing circuit current.

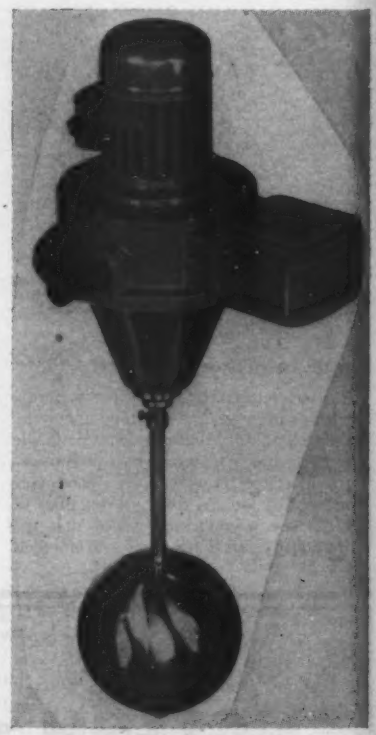
Long distance remote control, liquid level control and photo cell applications are also possible with this unit. *Cutler-Hammer Inc.*
Circle No. 20 on Readers' Service Card

Method to measure generator field temperature

Combining a known electrical principle with standard recording instruments, a new method to measure generator field temperature has been developed.

Designated as the Kelvin double-bridge indicating recorder, this measurement instrument can be applied to all electric generators used in modern power generation plants.

While this method of measurement is used mainly on ac power generators, it can also be applied to field temperature measurements of dc motors and generators and synchronous motors, converters and condensers. *General Electric.*
Circle No 21 on Readers' Service Card



Consistency regulator

Arca is a Swedish firm specializing in the manufacture of automatic precision regulators.

Pictured above is an electronically-controlled pulp density regulator which this company has introduced to this country.

This unit employs no contacts, is reliable in operation, has great precision and provides highly accurate regulation.

It is easy to install and can be used for

regulating all kinds of pulp at concentrations between 0.8 and 7 per cent.

The main components are: an indicator with impulse generator and impulse organ servomotor; a Ferraritype, a regulating valve with limit cut out; and a relay box with signal lamps and switches.

More technical information is available from the American distributor. *Mertecfelt Corp.*

Circle No. 22 on Readers' Service Card

Multiple operation time switch

A completely automatic, 24-hr. time switch has been developed to handle as many as 48-on and 48-off operations in one day. Typical operations on which it can be used include heating and air conditioning equipment, oil and gas burners and other types of units.

A control dial (see photo above), scaled in 15-min. graduations, is used to set up a daily operating schedule. Running periods are set by sliding self-contained, non-removable trip levers in or out on the dial. The switch will repeat the entire schedule automatically each day. *Zenith Electric Co.*

Circle No. 23 on Readers' Service Card

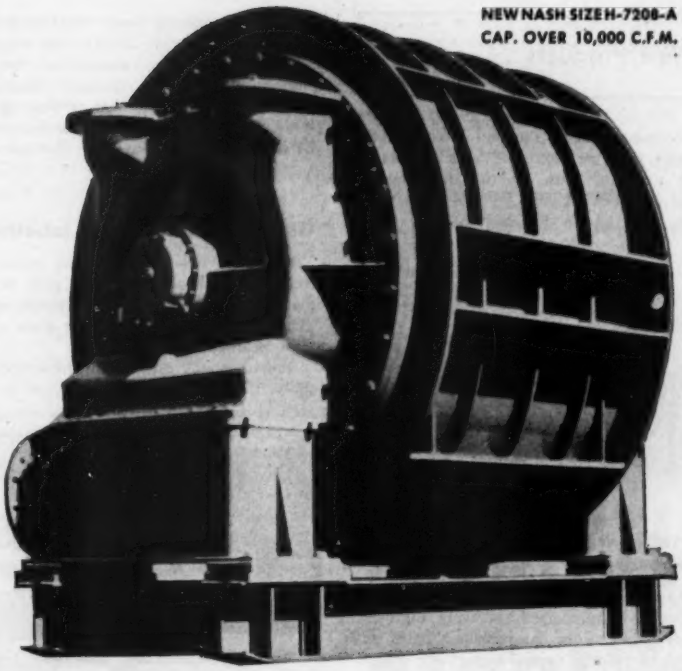
Slime control agent

Called TBTO, a new chemical now on the market, promises easier, safer and more economical control of slime in paper and pulp water systems.

The company states that the agent has proved safer for humans to handle and also states that it is entirely non-corrosive.

TBTO builds up a protective coating on walls of tanks, canals and systems which prevents the accumulation of micro-organisms and reduces time-consuming clean up

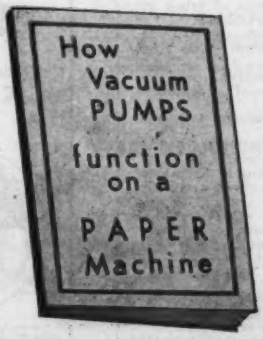
NEW NASH SIZE H-7206-A
CAP. OVER 10,000 C.F.M.



If three days lost production on a paper machine amounts to more than the cost of Vacuum Pumps, dependability is the prime factor in pump selection.

Over a thousand leading mills depend on Nash Vacuum Pumps to insure continuous production. Nash Pumps are built sturdy enough to stand the pounding of continuous production. They are simple. They have no internal parts in wearing contact. They will handle slugs of water or stock. They are designed to operate at the low speeds necessary for long life and reliability. Don't gamble with your production. Install Nash Vacuum Pumps and be safe.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONN. U.S.A.



Of equal interest to Management and to Machine Operators is this informative booklet just published. A copy will be mailed to you free upon request.

Name_____

Address_____

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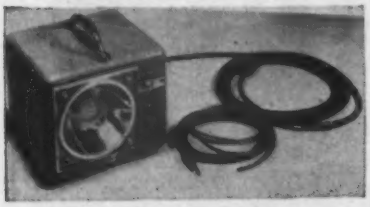
State_____

New Products . . .

requirements. The company invites your requests for free literature which contains more technical data on this new agent. *Metal & Thermit Corp.*
Circle No. 24 on Readers' Service Card



Portable white light stroboscope

The unit pictured above is the new design of a miniaturized, portable high intensity white light stroboscope. It is designed to fill the need for viewing rotary, reciprocating or repetitive motion.

For use in printing, the unit can be set up on a press and synchronized so that any moving part of the press is visible and appears stationary.

The stroboscope is also designed for use on production machinery. It can be set up on the machinery and synchronized so that the stroboscopic effect of the repetitive light "freezes" the motion of the machinery. This allows precise observation, monitoring and adjustment of moving parts without a shut down. *Western Gear Corp.*
Circle No. 25 on Readers' Service Card

Glue for use in bottle labeling

Glastack-9499 is a new glue recently introduced to the market. This glue will actually penetrate the silicone layer on any glass container to bond on the glass surface underneath.

The company states that laboratory test show that the adhesive provides a bond well within the requirements of Army-Med specification PPP-M-00186 for water immersion.

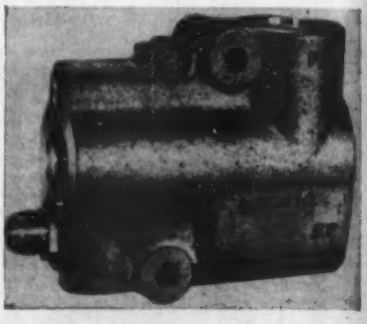
The glue is offered in three viscosities for different classes of coller-proof work. *Paisley Products Inc.*
Circle No. 26 on Readers' Service Card

Roll-end binding machine

A roll-end binding machine, together with a minimum of two 15-ft. sections of power conveyor and electrical controls, will provide a completely automatic strapping operation for the ends of large paper rolls.

The company states that the machine can handle upwards of 70 rolls per hour, depending somewhat on the average diameter of the rolls and the nature of the conveyor equipment used. The rolls can be 32 in. to 60 in. in diameter and any width that can be handled by the conveyor.

Further information on the method of operation will be given upon request. *Signode Steel Strapping Co.*
Circle No. 27 on Readers' Service Card



Flow divider

The unit pictured above has been designed to meet the requirements of equipment needing better control of the higher pressures characteristic of larger equipment. It will be known as the 1088.

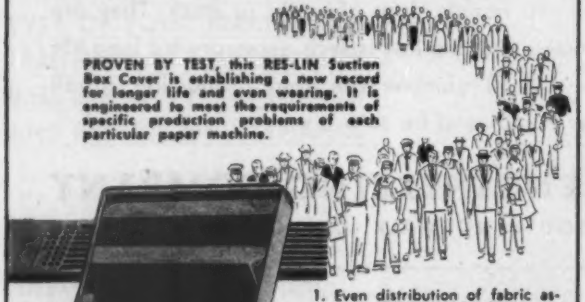
One feature in this unit is an adjustment device which can decrease or increase the flow on the controlled flow side to the rate of flow in proper proportion to meet the

RESLIN *wire saver*

Suction Box Covers now lead

No other Suction Box Cover offers you so many advantages . . . that's why Mill after Mill have joined the fast growing parade of users.

PROVEN BY TEST, this RES-LIN Suction Box Cover is establishing a new record for longer life and even wearing. It is engineered to meet the requirements of specific production problems of each particular paper machine.



1. Even distribution of fabric assures EVEN WEARING.
2. Ends of threads contact wire, assuring uniform surface to wire.
3. Increased wire life.
4. Many years of trouble-free service.
5. Resurfacing reduced to a minimum.
6. Expansion and contraction is reduced to a minimum.
7. Reslin can supply a greater open area without sacrificing strength.
8. Requires no wet storage or care when machine is down.
9. Easily installed.
10. No other can offer as even-wearing and wax-like surface as Reslin.

WIRE RES-LIN SAVER

Write for Further Information and Sample of Material

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APPLETON WISCONSIN

JOSEPH ROBB & CO. LTD.
MONTREAL 30, QUEBEC
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WOOD TANKS

Built from best tank grade lumber. Backed by over 75 years' tank building experience. *Kalamazoo* can give you what you want. Free estimates and suggestions. Write today.

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CONSULTING ENGINEERS

Specializing since 1923 in all phases of design, modernization and expansion of pulp and paper mills from forest to finished product.

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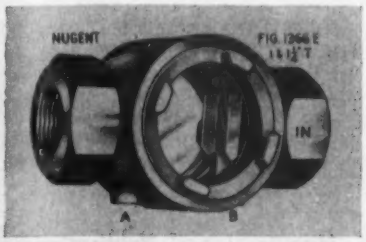
requirements of the job. Another is a built-in relief valve that by-passes oil back to the sump when the peak pressure setting of the secondary flow is reached. *New Products Corp.*

Circle No. 28 on Readers' Service Card



Sight-flow fitting

A new improved sight-flow fitting used to indicate the flow of liquid in a pipe line has been announced.

The fitting has a spring-compensated, hinged indicator gate which moves in proportion to the flow and is visible from either side of the fitting, even when the liquid is dark or discolored. Windows are easily removed for cleaning.

Made in brass, cast iron or steel-flanged or tapped, the fittings are available in sizes ⅜ in. to 6 in. *Wm. W. Nugent & Co.*

Circle No. 29 on Readers' Service Card

High-capacity jibs

Pictured above is one of the three new high-capacity jibs which have been developed for use on the Link-Belt 88, 98 and 108 series crawler and rubber-tired shovel-cranes.

The jibs are in lengths of 20, 30 and 40 ft. and have capacities of 6, 5 and 4 tons. *Link-Belt Corp.*

Circle No. 30 on Readers' Service Card

Corrosion-proof cement

Multibond is the name given to a corrosion-proof cement which has recently been developed.

This acid-proof mortar for brick and tile linings is ideal for acid and chlorine service in pulp and paper mills. *Nukem Products Corp.*

Circle No. 31 on Readers' Service Card

Vibration monitor system

A new non-electronic vibration monitor system that is sensitive to increases in vibration yet ignores both starting vibration and transient shocks normal to operation has been developed.

Applications include the protection of pumps, motors, blowers, compressors, centrifuges, engines, turbines and other costly equipment. The model 651 control unit is available for use in dc circuits. *Robertshaw-Fulton Controls Co.*

Circle No. 32 on Readers' Service Card

Two slitting machines

Two new slitting machines now on the market, one a 2500-fpm the other a 1700-fpm, can cut card stock to size within a tolerance of plus or minus 1/1000 of an inch. Both use the shear-cut principle.

Further technical details are available. *Kidder Press Co.*

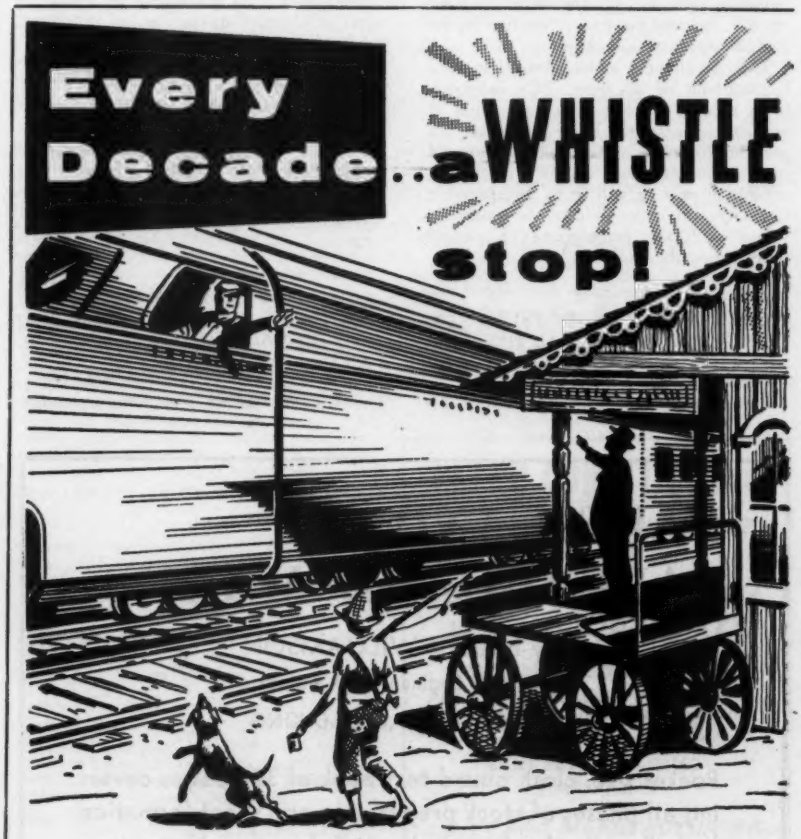
Circle No. 33 on Readers' Service Card

Polyethylene laminator

A new polyethylene extrusion laminator has been designed to fill the need for a high-speed pilot plant and commercial unit in web widths from 24 in. to 48 in.

The machine consists of an unwind stand with air-operated tension control and the polyethylene laminator. *Black-Clawson Co.*

Circle No. 34 on Readers' Service Card



The older we grow, the faster the months, years, decades whisk by. We at Lindsay endeavor to catch flying time long enough to expand and improve our facilities year after year. No expenditure lacks for exhaustive consideration if it promises to enhance the quality of Lindsay Fourdrinier wires and hence the quality of America's paper.

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LINDSAY WIRES Since 1904
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NEW LITERATURE

Books

HANDBOOK OF SOLVENTS. By Ibert Mellan. Published by Reinhold Publishing Corp. 430 Park Ave., New York 22, N. Y. 249 pages. $6.50.

To be published in several volumes, this reference work presents concise information on the composition and properties of industrial solvents.

This is volume 1 and is devoted to pure hydrocarbons of all types. This handbook is an attempt to select from the amount of available literature, those materials of greatest practical value, and to present them in an organized, compact, readily accessible manner. It will be an indispensable time-saver for every industry or group involved with the manufacture or use of pure hydrocarbon solvents.

ENCYCLOPEDIA OF INSTRUMENTATION FOR INDUSTRIAL HYGIENE. Technical editors: C. D. Yaffe, A. D. Hosey and D. H. Byers. Published by University of Michigan, Institute of Industrial Health and School of Public Health. 1243 pages. $30.00.

The content of this encyclopedia will be useful to everyone employing instrumentation, regardless of his field of interest.

There are seven sections of the book covering 500 instruments, produced by 60 manufacturers, for measuring air contaminants in occupied spaces; for use in laboratories; for air pollution and meteorology; for air velocity and metering; for sound and vibration; for ionizing radiations; and for ultra violet, visible and infrared energy.

Each section includes; a comprehensive review of instrumentation in that area; technical papers devoted to special problems of instruments used; and descriptions of available instruments used in the field.

USDA Reports

TECHNICAL NOTES. Lake States Forest Experiment Station, St. Paul 1, Minn. Four new Technical Notes are now being issued at this station. The notes cover the following subjects: Twelve-year results of a mechanical thinning in over-dense jack pine—TN No. 489; Five-year results in an aspen sucker density study —TN No. 490; Growth and yield of a young red pine plantation in northern Minnesota—TN No. 491, and Measuring the results of aerial spraying with herbicides for forestry purposes—TN No. 492.

FOREST INSECT CONDITIONS IN THE SOUTHEAST DURING 1956. By W. F. McCambridge and R. J. Kowal. Station Paper No. 76 dated April 1957. Reports from the southern states on the insect conditions during 1956 are compiled in this booklet. Types of insects and treatment used are given.

PAPER AND PAPERBOARD MAKING

By HARRY WILLIAMSON

Consulting Engineer and Author of

LESSONS IN PAPER MAKING

Pocket size, cloth bound text book of 372 pages covering all phases of stock preparation and sheet formation including the fundamental principles of making paper on the fourdrinier machine and paperboard on the multiple cylinder machine.

The author has fulfilled a life-long ambition to translate nearly fifty years of practical experience in a book that will be useful to the practical papermaker, technologist and executive.

Price $6.00 prepaid with order

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431 So. Dearborn Street, Chicago 5, Illinois

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Brochure on sulfur

Stauffer Chemical Co. has just published a 48-page brochure on sulfur. The brochure contains a description of production and refining techniques, statistics on the production of sulfur and notes on the various uses of the material. It also gives tabulations of the physical and chemical properties of sulfur in its different forms.

Circle No. 35 on Readers' Service Card

Edge position control

Askania Regulator Co. How to accurately maintain the correct lateral edge position of a moving web of paper, film or foil during converting operations is the subject covered in the company's bulletin. The bulletin gives drawings and explanations for the many uses of the Askania Edge position control unit.

Circle No. 36 on Readers' Service Card

Waste treatment

Infilco Inc. This is a reprint of an article entitled Sall Mountain's Unusual Effluent Treatment Plant. The article deals with treatment in a plant specializing in the manufacture of asbestos papers. This article should be of interest to all engineers and operators concerned with efficient and economical solution of such problems.

Circle No. 37 on Readers' Service Card

Cellophane storage and handling rules

American Viscose Corp. Posters presenting the rules for proper storage and handling of cellophane are being distributed by the company. They are designed for hanging in the storage and wrapping areas of the plant. They are suited for companies desiring to focus employee attention on the correct methods for storing and handling cellophane.

Circle No. 38 on Readers' Service Card

Intermediates for resins and plasticizers

Union Carbide & Carbon Corp. Diethylene glycol and triethylene glycol are important as intermediates for resins and plasticizers. These are discussed in a new 16-page data folder just released by the company.

Circle No. 39 on Readers' Service Card

Diaphragm control valves

Minneapolis-Honeywell Regulator Co. Two new specification sheets which give details of con-

struction on single-seated and double-seated Series 800 diaphragm control valves.

Circle No. 40 on Readers' Service Card

Slab chipper

Carthage Machine Co. The company has published a bulletin which describes and gives specifications on the Carthage 39 slab chipper. This chipper has a horizontal feed spout, which simplifies handling of long slabs and permits automated chipping when fed by the same conveyor used to take slabs away from the slab barker.

Circle No. 41 on Readers' Service Card

Electromagnetic control catalogs

Automatic Switch Co. Here is a list of recently published catalogs on electromagnetic control. Catalog 57-S1 provides complete information on automatic transfer switches—mechanically or magnetically held. Catalog 57-S2 covers the company's line of remote control switches for accessible control of power and lighting circuits from any number of control stations. Catalog 57-S3 describes the line of magnetically-held contactors. Catalog 57-S4 gives information on the complete line of relays and also describes the line of special purpose relays. Catalog 57-S5 includes ac and dc solenoids. Catalog 57-S6 describes electric plant controls. Materials includes complete systems, etc. Catalog 57-S7 is the complete electromagnetic control catalog. This combines information on catalogs 57-S1 through 57-S6. Any of these catalogs are available upon requests written on company letterheads only.

Circle No. 42 on Readers' Service Card

Flexon flexible connectors

Flexonics Corp. A new illustrative bulletin offering complete information on how to absorb vibration, dampen noise, reduce piping failure and prevent leakage. Specifications on pipe sizes and fitting connections are shown as well as operating pressures and installation procedures.

Circle No. 43 on Readers' Service Card

Flow distributor

Sandy Hill Iron & Brass Works. Drawings and descriptions of the Sandy Hill flow control unit incorporating the Bertrams multiple manifold flow distributor are covered in a brochure. Schematic drawings and technical information are given.

Circle No. 44 on Readers' Service Card

Buttons for lighted switches

Minneapolis-Honeywell Regulator Co. A data sheet describing and illustrating the company's line of buttons for lighted pushbutton switches.

Circle No. 45 on Readers' Service Card

Automatic web guide

Stanford Engineering Co. A brochure describing the automatic web guide. Photos of installation and other technical information are given.

Circle No. 46 on Readers' Service Card

Conveyor systems

Jervis B. Webb Co. The floor Towveyor and overhead Tow-Conveyor systems are covered in detail in the company's catalog. The catalog includes pictures and descriptions of the many applications offered by the systems.

Circle No. 47 on Readers' Service Card

Servicing industrial electrical equipment

Simpson Electric Co. This is a bulletin containing up-to-date listings of test equipment. The company's newest products are also listed.

Circle No. 48 on Readers' Service Card

Contact meter-relays

Assembly Products Inc. Contact meter-relays, versatile instruments that both indicate and control almost any physical or chemical condition that can be detected electrically, are described in a 40-page catalog. The catalog supplies complete information for ordering meter-relays intended for use in original equipment or in self-contained control packages.

Circle No. 49 on Readers' Service Card

Pump maintenance record card

Goulds Pumps Inc. Pump maintenance record cards which provide complete information on installation, application and maintenance are being offered by the company. Space is provided on these file cards to keep a complete record for a period of years. When requesting a supply of these cards, the company asks you to indicate the number of pumps for which cards are needed.

Circle No. 50 on Readers' Service Card

Chemi-pulper

Black-Clawson Co. The Pandia Chemi-pulper continuous digester is the subject of a new bulletin offered by the company. The eight pages explain the construction and operation of the three basic elements of the Chemi-pulper: the screw feeder, the digester tube assembly and the discharger.

Circle No. 51 on Readers' Service Card

Polyethylene cable insulation

Rome Cable Corp. This is a conference paper which was presented before the 1957 winter meeting of the American Institute of Electrical Engineers and is now available in booklet form. It contains detailed information on the development and use of polyethylene as an insulation and jacket material for power cables used on circuit voltages from 2300 through 33,000.

Circle No. 52 on Readers' Service Card

Water-treating processes

Cochrane Corp. This is a paper on the selection of water treating processes for medium pressure boilers that was presented at the annual ASME conference in 1956. Tables, diagrammatical drawings and photos are included in the paper, along with other technical information.

Circle No. 53 on Readers' Service Card

Automation system

Research-Cottrell Inc. A new bulletin describes the Cottrell automation system recently announced by the company. The 8-page bulletin defines the term "Ideal Electrical Power" and demonstrates this system by means of comparative charts.

Circle No. 54 on Readers' Service Card

Conveyor belt catalog

Raybestos Manhattan Inc. This company has published a new catalog covering conveyor and elevator belts. It includes new style designations of general service heavy-duty types.

Circle No. 55 on Readers' Service Card

Corrosion-resistant fittings

Horace T. Potts Co. The company offers a 21-page booklet describing its line of corrosion-resistant fittings called Speedline for use on stainless steel piping installation. Specification charts and diagrammatic drawings are given.

Circle No. 56 on Readers' Service Card

Drive unit

Allis-Chalmers Mfg. Co. How the Ultra-Speed package drive unit is meeting many requirements for dc power in the pulp and paper industry to make possible higher flexibility of machines and equipment is told in a new bulletin just released by the company.

Circle No. 57 on Readers' Service Card

Rolls for the paper industry

Rodney Hunt Machine Co. Eight different types of rolls used in the paper industry—breast rolls, table rolls, wire rolls, spreader rolls, wet felt rolls, drier felt rolls and press rolls, are all described in a 9-page bulletin offered by this company.

Circle No. 58 on Readers' Service Card

Circulating oil system

Farval Corp. The manufacturer has made an announcement on the development of a new type circulating oil system to be marketed under the tradename of "Lubrival". An 8-page illustrated brochure for complete information on Lubrival is available upon request.

Circle No. 59 on Readers' Service Card

Schooling for industrial truck users

Clark Equipment Co. The Field Service School of the Industrial Truck Division now has an 8-page brochure for release describing the facilities, methods of teaching and courses of study utilized to teach maintenance and repair of Clark's industrial trucks. These three-week courses are available free to the users of Clark equipment.

Circle No. 60 on Readers' Service Card

Chemlon mechanical packings

Crane Packing Co. Complete service and technical details on chemically-enert mechanical packings fabricated from DuPont Teflon are provided in a new brochure. The brochure includes 15 types of packings along with their applications, temperatures and recommendations as to services.

Circle No. 61 on Readers' Service Card

Field temperature measurement

General Electric Co. A data sheet is offered explaining a convenient means of measuring the temperature of generator field windings by employing a Kelvin double-bridge circuit with

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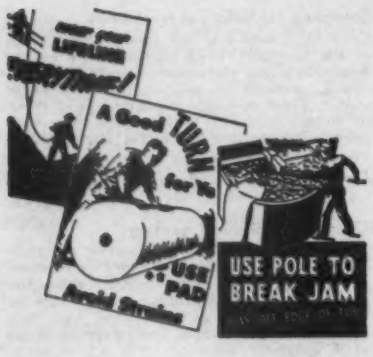
POSTERS
— A POTENT SAFETY TOOL



Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition and continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in three sizes: "A" size, 8½" x 11½"; "B" size, 17x23"; and "C" size, 25x38". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL

425 N. Michigan Ave.
Chicago 11, Illinois

New Literature . . .

standard indicating recording instruments. The sheet gives technical information on the operation and physical setup of this system.
Circle No. 62 on Readers' Service Card

Regrinding rubber rolls
Rodney Hunt Machine Co. "Regrinding rubber rolls" is the title of a report intended to assist mill engineers in establishing a well-planned roll maintenance program to increase the service life of rubber rolls.
Circle No. 63 on Readers' Service Card

Non-lubricated bearings
Electro-Nite Carbon Co. Non-lubricated bearings made from carbon-graphite material is the subject of a 12-page illustrated catalog. These bearings operate under very high temperatures, are chemically inert and have overcome many problems in the paper industry.
Circle No. 64 on Readers' Service Card

Magnetic clutch
Fawick Corp. A 6-page bulletin titled "The World's Finest Magnetic Clutch" provides dimensional drawings and specifications on the model SC magnetic clutch (stationary field type). The company's magnetic brake, model SB and model SBR, are also covered in the bulletin.
Circle No. 65 on Readers' Service Card

Control of stock preparation
Bailey Meter Co. This is a performance report published by the company on a problem concerning a desirable system for fingertip control of stock preparation. The report tells the problem, solution, operation of the system used and the results accomplished.
Circle No. 66 on Readers' Service Card

Pipe and block insulation
Ehret Magnesia Mfg. Co. announces the availability of a new bulletin covering the company's line of calcium silicate insulations for temperatures up to 1200° F. This new material, with the trade name of Thermasil, finds major uses in the power and process industries.
Circle No. 67 on Readers' Service Card

V-belt drives
Raybestos-Manhattan Inc. A 112-page engineering data book for the selection and design of Poly-V belt drives has been published by the company. Charts, tables, diagrams and complete specifications for all drive sizes are included.
Circle No. 68 on Readers' Service Card

Precision switches
Minneapolis-Honeywell Regulator Co. Listed in this bulletin are some of the newest precision switches developed by the company. These switches have been designed for modern electronic control requirements.
Circle No. 69 on Readers' Service Card

Barrel pump
Milton Roy Co. has recently published a bulletin on its new controlled-volume barrel pump. It describes the advantages of the pump in combined pumping and metering of toxic or corrosive chemicals from barrels or drums.
Circle No. 70 on Readers' Service Card

Transformer maintenance
Westinghouse Electric Corp. This booklet discusses transformers and their maintenance. It also includes such subjects as general inspection procedures, classification of transformers, methods of drying out and transformer connections. It is written for maintenance people in electric utilities.
Circle No. 71 on Readers' Service Card

Malfunction detector
Robertshaw-Fulton Controls Co. A device known as the Vibraswitch will automatically shut down protected equipment or sound an alarm the instant normal operating vibration is exceeded. This malfunction detector is used for attended as well as unattended machinery.
Circle No. 72 on Readers' Service Card

Industrial truck batteries
Gould-National Batteries Inc. Full details of battery construction and complete engineering specifications are given in a bulletin published by the company.
Circle No. 73 on Readers' Service Card

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Pulp and Paper, Volume 1	$18.00
Pulp and Paper Volume II	18.00
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Notes and Observation on Beaters	1.00
Trouble on the Paper Machine	.75
Technology of Papermaking Fibers	.50

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FOR SALE:

3 Combustion Engineering Company 500 H.P. Automatic Spreader Type Stoker Fired Boilers — one new in 1947, two in 1946. Type VMH Furnace width at Boiler 14', heat surface 5,880 square feet.

476 Tubes 3¼" Diameter x .120. Size 14'-28-3-¼", VMH 13-36, 36, 48-17'. Design Pressure 201-Pounds, built to A.S.M.E. Rules. Contract No. 35846-BV and 22246-BV. Serial Nos. 3434, 3316, 3314. 2 Boilers equipped with Combustion Engineering Company Automatic Spreader Stokers, 1 with American Engineering Company Automatic Spreader Stoker. Two with Steam Turbine driven forced Draft Fans, one with Motorized Fan. Each with Proportioneer Adjust-O-Feeder Pump, Hays Recording Meters and Controls.

These Boilers are completely dismantled and will be sold in a group or singly, as customers may desire. The boilers and equipment are in very excellent condition and will make a very good buy for anyone who has a use for a 3-Drum Bent Tube Low Head Boiler. Each Boiler is rated at 50,000 lbs. steam per hour. If interested, write direct to Chief Engineer, Groveton Papers Company, Groveton, New Hampshire.

INDUSTRIAL ENGINEER WANTED

Graduate Industrial Engineer with practical experience in the paper industry. A knowledge of paper finishing is desirable. Should have ability in organization, expansion, mechanization and labor relations. Under 38 years of age, good salary and benefits. Fine opportunity for a man who is energetic and desires a challenge. Send detailed resume of experience and education to Personnel Manager, West Virginia Pulp and Paper Co., Luke, Maryland.

FOR SALE

1—4'x10' surface type F300 Tyler Ty Rock Screen, complete with 1—7½ HP motor with base, 1—7½ HP V-belt drive, and 1—set of drive and fly wheel guards.

Practically new. In excellent condition. Can even be used as gravel sifter. Inspect at any time upon notice to Purchasing Agent. Best offer will be entertained. Address reply to: Peter J. Schweitzer, Inc., Spotswood, New Jersey.

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Capable of taking complete charge of paper or board mill. Thorough experience in paper making, both technical & practical background. Lawrence Sochia, 476 Pawling Ave., Troy, N.Y.

FOR SALE

1 Mitts & Merrill No. 15 CSE Hog, excellent condition, with several sets of high grade steel knives. Immediately available. Inspection invited upon due notice to purchasing agent. Best offer will be entertained. Address reply to Peter J. Schweitzer, Inc., Spotswood, New Jersey.

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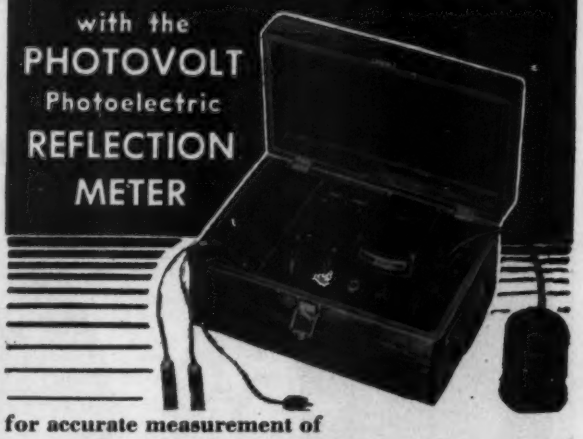

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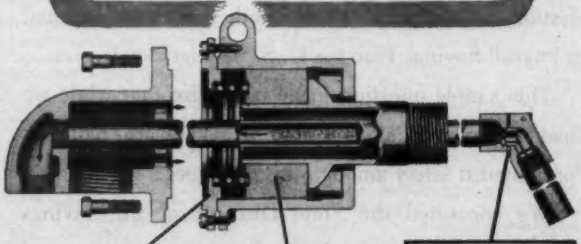

ASSEMBLY PLATE — Holds internal parts in position when head is removed.

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SYPHON ELBOW — Permits use of straight pipe for syphon. Can be inserted or withdrawn right through the joint.

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Bulletin S-2001 has all the facts on this joint-and-elbow combination that supports itself, has no packing, needs no lubrication, outmodes unwieldy syphon pipes. Johnson Joints are also available in pipe-supported and rod-supported types, to suit all operating needs.

The Johnson Corporation

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A new employee gave us the idea...

Several weeks ago, a young chap being processed by our personnel people—you know, for insurance, hospitalization and so forth—asked whether our company had a Payroll Savings Plan for U. S. Savings Bonds.

This simple question made us realize that while we had a Payroll Savings Plan available we had not promoted it lately among our employees.

We contacted the State Director of the Savings Bonds Division of the U. S. Treasury and discussed this matter. He helped us work out a promotion plan to contact every employee on the Payroll, and thereafter, each new employee we hired. He supplied literature, posters and so forth and helped train the canvassers to do an educational promotion among our employees.

In a short time, with practically no disruption of our business, our campaign was successful. The enthusiastic response floored us. This proved to us employees *want* to save part of their pay and they welcome the convenient Payroll Savings Plan for buying U. S. Savings Bonds.

Your State Director, Savings Bond Division, U. S. Treasury Department, will be glad to help you install The Payroll Savings Plan, or build participation in an existing plan. Write: Savings Bonds Division, U. S. Treasury Department, Washington 25, D. C.

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The PAPER INDUSTRY

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light silesias	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.
No. 1 roofing (Chicago)	.80— .85
No. 2 roofing (Chicago)	.60— .65
Twos and blues, repacked	1.50— 1.75
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites, miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

	per cwt.
New dark cuttings	Nominal
New mixed cuttings	
New light silesias	
Light flannelettes	
Unbleached cuttings	
New white cuttings	
New light oxfords	
New light prints	

Old Rags

	per cwt.
No. 1 white linens	Nominal
No. 2 white linens	
No. 3 white linens	
No. 4 white linens	
No. 1 white cottons	
No. 2 white cottons	
No. 3 white cottons	
No. 4 white cottons	
Extra light prints	
Ordinary light prints	
Medium light prints	
Dutch blue cottons	
French blue cottons	
French blue linens	
Checks and blues	
Linsey garments	
Bark cottons	
Old shopperies	

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	5.50— 6.00
Gunny No. 1, foreign	5.50— 6.00
No. 1 manila rope, domestic	7.75— 8.25
No. 1 manila rope, foreign	6.25— 6.50
New burlap cuts (soft)	6.00— 6.50
Sisal strings	4.25— 4.50
Mixed strings	1.50— 1.75

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	105.00—115.00
No. 1 hard white shavings	85.00— 90.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	55.00— 65.00
Fly leaf shavings No. 1	25.00— 30.00
Fly leaf, woody, No. 1	30.00— 35.00
Mixed colored shavings	18.00— 20.00
No. 1 books and magazines	17.00— 18.00
Ledger stock, white, No. 1 (carloads)	45.00— 50.00
Ledger stock, colored, No. 1 (Midwest ship)	25.00—
New manila envelope cuttings (free of groundwood)	60.00— 65.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	55.00— 60.00
Colored tab cards	40.00— 45.00
New all-kraft envelope cuttings	—
Triple sorted kraft, 100%	25.00— 30.00
No. 1 old kraft	25.00—
White news cuts, No. 1	50.00— 55.00
No. 1 overissue news	14.00— 16.00
Folded news, special	12.00— 13.00
Folded news, ordinary	9.00— 11.00
Old corrugated boxes	14.00— 15.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	9.00— 11.00
Boxboard cuttings	6.00— 7.00
No. 1 mixed paper	2.00— 3.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt	5.05—
Powdered, drums, works, cwt	5.20—
1-Arginine, drums, kilo	74.80—
Blanc Fixe	
Direct process, bags, c.l., works, ton	110.00—
L. c. l., works, ton	120.00—
Bleaching Powder, drums, cwt	
Casein, domestic acid precipitated	
Standard, bags, 10,000-lb. lots or more, shipping point, lb	No Prices
Premium, bags, 10,000-lb. lots or more, shipping point, lb	No Prices
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh, bags, c. l., Georgia works, ton	10.00—
300-mesh, bags, c. l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— 35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt	3.15—
Glycerine, refined (CP, USP) 99%, drums, c. l., delivered lb.	.29½—
Litharge, commercial powdered	
Barrels, c. l., works, freight equalled, lb.	.17—
Rosin, gum, c. l., f.o.b. New York, cwt	
E	8.90—
F	8.90—
G	8.90—
WW	10.30—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	8.00—
N	8.10—
WG	8.60—
WW	8.90—
Saltcake, domestic, bulk Works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c. l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt.	4.70—
Solid, 76%, drums, c. l. works, cwt.	—
Sodium Silicate	
40°Be, 1:3, 2, turbid, drums, c. l., works, cwt.	1.55—
52°Be, turbid, 1:2, 4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.47—
Pearl, 100-lb. bags, cwt.	7.32—
Powdered, 100-lb. paper bags, cwt.	7.44—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	26.50—
Talc	
Domestic, bags, c. l. works, ton	—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Dioxide	
Pigment, calcium-rutile base, regular, bags, c. l., lb.	.09¼—
High-tinting, drums, c. l., lb.	.09 —
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l., freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	150.00—
Bleached sulfite, Canadian	150.00—
Unbleached sulfite	130.00—
Unbleached sulfite, Canadian	130.00—
Bleached soda	145.00—
Bleached soda, Canadian	145.00—
Kraft, bleached hardwood	150.00—
Kraft, bleached	152.00—155.00
Kraft, bleached southern	155.00—
Kraft, bleached Canadian	155.00—
Kraft, unbleached southern	117.50—122.50
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	130.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	72.50—
Sulfate screenings	67.50—
Groundwood, dom.	—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	150.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	150.00—
Bleached sulfite, Finish, freight allowed	150.00—
Unbleached sulfite, Swedish, freight allowed	130.00—
Unbleached sulfite, Finnish, freight allowed	130.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	155.00—
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.30
No. 2 enamels	19.30
Machine-coated, 45- to 100-lb.	15.20— 18.90
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	17.05
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	16.15
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	63.20
75% "	48.45
50% "	36.95
25% "	31.00
Rag Content Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
100% rag	64.40
75% "	49.60
50% "	38.10
25% "	32.20
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	22.50
No. 2	21.75
No. 4	20.35
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	23.70
No. 2	22.95
No. 4	21.55
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Tissues (carlots)	per ream
White No. 1	
White No. 2	
Bleached anti-tarnish	
Colored	
Anti-tarnish kraft	
Manila	
Napkins, semi-crepe (12½ lb. to M shts) per case	
Napkins, full crepe and embossed (12½ lb. to M shts) per case	
Toilet, bleached (M shts) per case	
Toilet, unbleached (M shts) per case	
Wrappings (kraft, basis 50 lb. and heavier)	per cwt
Standard wrapping	9.25
Butchers, counter rolls	10.25
Standard bagging, mill rolls	
Shipping sack, mill rolls	
Gumming, mill rolls	
Asphalting, mill rolls	
Envelope, mill rolls	

Names in the News . .

(Continued from page 250)

representative, becomes assistant sales manager of the New York area steel service plant; **Ronald S. Yale,** a salesman, takes over as products sponsor for sheet and strip sales at the Milwaukee plant; **Jack R. Freiday,** assistant traffic manager, has been named manager of traffic contracts, and **Glen H. Reno,** staff analyst in the traffic department, succeeds Freiday as assistant traffic manager.

Necrology . . .

William H. Brydges

William H. Brydges, 76, a past president and trustee of the American Pulp & Paper Mill Superintendents Association, died in May at his home in Virginia.

From 1927 until his retirement several years ago Brydges was superintendent of Bedford Pulp & Paper Co. Inc. (now National Container Corp. of Virginia) in Big Island, Va.

Prior to his association with Bedford Pulp & Paper, Brydges had been on the staff of Defiance Paper Co. in Niagara Falls, N. Y.

Otto F. Behrend

Dr. Otto F. Behrend, co-founder and first treasurer of Hammermill Paper Co., died May 20 at the age of 84.

A native of eastern Germany, Dr. Behrend received a Pd. D. in chemistry from the University of Berlin in 1896, following which he worked on the staffs of various German paper mills.

In 1898 Dr. Behrend came to the United States and with the aid of his brother Ernst founded Hammermill Paper on the eastern outskirts of Erie, Pa. During the early years he helped supervise construction of the plant and for a time was vice president, secretary and "entire" laboratory staff. He was a pioneer in establishing laboratory control in the industry.

Injured in an automobile accident in 1952, Dr. Behrend retired from active service in 1953 but continued to serve as a director until August of 1955.

R. S. Wertheimer

R. S. Wertheimer, vice president and resident manager of Longview Fibre Co. in Longview, Wash., died May 19 while at work.

A graduate of the Massachusetts Institute of Technology, Wertheimer had been associated with Longview since September 1926, when he joined the staff as an engineer. From 1924 to 1926 he was assistant engineer at Thilmany Pulp & Paper Co. in Kaukauna, Wis.

President of the Pacific Coast Association of Pulp & Paper Manufacturers, he was also vice president of the Northwest Pulp & Paper Association and a member of the operating committee of the National Council for Stream Improvement Inc.

Walter L. McHale

Walter L. McHale, 60, vice president and mill manager of Southland Paper Mills Inc. in Lufkin, Texas, died May 17 after a short illness.

McHale was general manager for Geo. F. Hardy Engineers Co. of New York, N. Y., consultant at the time of the construction of the mill. In 1944 he became an executive with Southland, in which capacity he played a vital role in the recent and current expansion projects.

Frank A. Juckett

Frank A. Juckett

Frank A. Juckett, 74, president of Sandy Hill Iron & Brass Works at Hudson Falls, N. Y., died unexpectedly May 14. He was en route from a two-day business trip to Washington, D. C.

For most of his business life Juckett had been a manufacturer of paper and paper machinery. He became president of Sandy Hill in 1936. Previously he had been president of a fine paper mill in the Berkshires; president and founder of Old Colony Envelope Co. at Westfield, Mass., and a sales and advertising executive for Strathmore Paper Co. in West Springfield.

H. W. Walkinshaw

Harold W. Walkinshaw, safety engineer and assistant manager of industrial relations for Strathmore Paper Co. in West Springfield, Mass., died recently at the age of 56.

Walkinshaw had been associated with the Massachusetts firm since 1917, when he joined the staff as an office boy. In 1948 he was appointed to the position he held at the time of his death.

A past president of the Industrial Association of Western Massachusetts, Walkinshaw was a member of the Springfield Safety Engineers Round Table, vice president for the past two years of the Safety Council of Western Massachusetts and a member of that organization's board of directors and executive committee.

James L. Braman, 75, retired board chairman of F. C. Huyck & Sons, died in May at an Albany, N. Y. hospital. Braman joined the Huyck organization in the late 1890s, became treasurer in 1933, vice president in 1938 and chairman of the board in 1947. He retired in 1953 but continued as a director.

Oscar M. Bonesho, 66, director of purchasing for Cornell Paperboard Products Co., died unexpectedly while attending church services recently in Milwaukee. He had been with Cornell Paperboard since 1920, when that firm merged Hummel & Downing Co.

Frank R. Freyler, 56, manager of the mid-Atlantic region for Allis-Chalmers Mfg. Co.'s Industries Group, died recently in Richmond, Va. He had been with the firm since 1929 and in 1950 was appointed to the position that he held at the time of his death.

Elmer L. Mumma, manager of the Hooper Box Machinery operations of Koppers Co. Inc., died recently in Pittsburgh, where he was attending a management seminar at the Carnegie Institute of Technology. He had been associated with F. X. Hooper Co. in Glenarm, Md., from 1929 to 1955, when that firm was acquired by Koppers. Mumma was considered an authority on corrugated box machinery.

Donald G. Kibbey, 63, at one time a vice president of APW Products Co. Inc. and more recently eastern division manager for Thomas Paper Stock Co. Inc. of Chicago, died May 3 in Albany, N. Y.

Clifford J. Yarber, 57, who retired in October as production manager for Chemical Paper Mfg. Co. and Crocker-McElwain Co. at Holyoke, Mass., died recently after a long illness.

Parker K. Baird Sr., retired head of the pulp and paper division of the U. S. Forest Products Laboratory, died recently in Madison, Wis. He had been associated with the laboratory since 1922.

Safety News . . .

(Continued from page 253)

Ore.; Certain-Teed Products Corp., Tacoma, Wash.; Brantford Roofing Co., St. John, N. B.; Fibreboard Paper Corp., Portland, Ore.; Brantford Roofing Co., Thorold, Ont.

Insulation and Building Board

Flintoke Co., Meridian plant; Johns-Manville Corp., Jarratt, Va.; Johns-Manville Corp., Natchez, Miss.; Flintoke Co., Hilo, Hawaii; Armstrong Cork Co., Macon, Ga.; United States Plywood Corp., Redding, Cal.; Simpson Logging Co., Shelton, Wash.; Flintkote Co., Insulrock Div., Richmond, Va.

Specialties

Behr-Manning, Troy, N. Y.; Marinette Paper Co., Fort Edward, N. Y.; Kimberly-Clark Corp., Niagara Falls, Ont.; Lily-Tulip Cup Corp., Augusta, Ga.; Crown Zellerbach Corp., San Leandro, Cal.; Individual Drinking Cup Co., Darlington, S. C.; Marathon Corp., Menasha, Wis.; Old Colony Envelope Co., Westfield, Mass.; Fibreboard Paper Products Corp., Emeryville, Cal.; International Paper Co., Kalamazoo, Mich.

Marinette Paper Co., South Glens Falls, N. Y.; Line Material Co., Sherman, Texas; Research Products Corp., Madison, Wis.; Container Corp. of America, Piqua, Ohio; International Paper Co., East Point, Ga.; Crown Zellerbach Corp., Western Waxide Div., Kansas City, Kans.; Lily-Tulip Cup Corp., Galva, Ill.

Division III — Pulpwood Logging

Chesapeake Corp. of Virginia, West Point, Va.

APPA Awards Announced

The American Paper & Pulp Association has given awards of merit for safety to 178 paper mills in 28 states.

The honor went to plants whose frequency rate of disabling injuries was below the industry average (1955) of 9.2 per 1,000,000 man-hours worked. (Of the winners, 22 had no lost-time injuries during 1955.)

Leaders in the industry-wide APPA accident prevention program were P. H. Glatfelter Co. of Spring Grove, Pa. (1,884,154 man-hours); Buckeye Cellulose Corp. of Memphis, Tenn. (1,347,072), and West Virginia Pulp & Paper Co. at Williamsport, Pa. (1,007,821).

Since the inception of the program in 1949, participation has increased 138 per cent from 141 to 336 mills. The injury frequency rate has dropped from 15.2 in 1949 to 9.2 in 1955, a 38 per cent reduction.

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Whither?

... in production, processes, new products, markets

Four new papers developed by Mosinee Paper Mills

Never Mold, Scrimtex, Seven-O and Hydensel are the names assigned to the new papers. Never-Mold remains mold resistant at all times irrespective of humidity and other extreme temperature and moisture conditions and has been accepted by the Armed Forces for long-term storage of Ordnance and Signal Corps equipment.

Scrimtex contains a reinforcing scrim or mesh of either fiberglass or rayon which imparts strength in all directions including puncture resistance. Scrimtex mail sacks are now in use between Seattle and Alaska and also in transatlantic mail service. A tremendous potential market for this paper is anticipated for various outdoor uses.

Seven-O is a chemically inert paper which has no corrosive effect on ferrous and most non-ferrous metals. It is used for packaging of special metal products.

Hydensel is a paper of high density replacing glassine and greaseproof for specific applications and as a release sheet for wax, rosin, etc.

What makes one adhesive tape stickier than another?

The latest results have shown that sticky films have a two-phase structure. One phase is smooth and the other phase occurs as tiny particles, giving the adhesive surface an uneven or pimply appearance under magnification.

Maximum tack occurs when the film contains 50-75 per cent resin tackifier, according to Dr. F. H. Wetzel of Hercules Powder Co. An increase of resin in the film beyond the maximum tack point causes the tack to fall off sharply. Generally speaking, films with low tack—whether inherent or induced by aging—have smooth surfaces.

Use of lignin sulfonates in clay products

The use of Orzan A (an ammonium lignin sulfonate) and Orzan S (a sodium lignin sulfonate) can result in increased production of clay products and refractories.

The main function of the Orzans, a product of Crown Zellerbach Corp., is to improve green strength and thus reduce kiln handling losses. The Orzans will also (1) produce a more plastic mix with better forming qualities; (2) give a tougher, more easily handled piece in the green state; (3) increase dry strength in the unfired state; (4) reduce losses from breakage and chipping, and (5) improve uniformity of the finished piece.

Infra-red predrying of paper

Infra-red heating of the moist paper web has been employed successfully to increase production output by 15-30 per cent. Heating the moist sheet reduces the viscosity of the water and therefore makes water removal from the sheet easier at the press rolls. Consequently, the paper will enter the drying section in a dryer state, and the temperature of the first drying cylinders can be raised to increase the output of the drying section.

Another advantage derived from preheating the moist sheet is that less pressure can be applied at the press rolls in order to accomplish the same effect as without predrying.

Now Solving Problems On the Spot In Mills Throughout The Country

This miniature saveall originally was designed and put to work in DARLING's laboratory . . . developing improved flocculation techniques for flotation savealls.

Having proved its worth in our laboratory, it is now being used right in the paper mill, working with white waters just as they come from the machines.

Guided by this pre-testing, the full-scale operating tests have shown many mills that—

In the majority of cases, one of DARLING's specifically-formulated GLUES reduced costs while maintaining or improving recovery efficiency.

Our Technical Service Representative would like to work with you in determining what can be accomplished in your mill. The cost of the glue and technical service are on us, so you've nothing to lose—much to gain. Arrangements can be made through your DARLING SALES REPRESENTATIVE. Or write, call, or wire us direct.

DARLING'S Improved BONE GLUE

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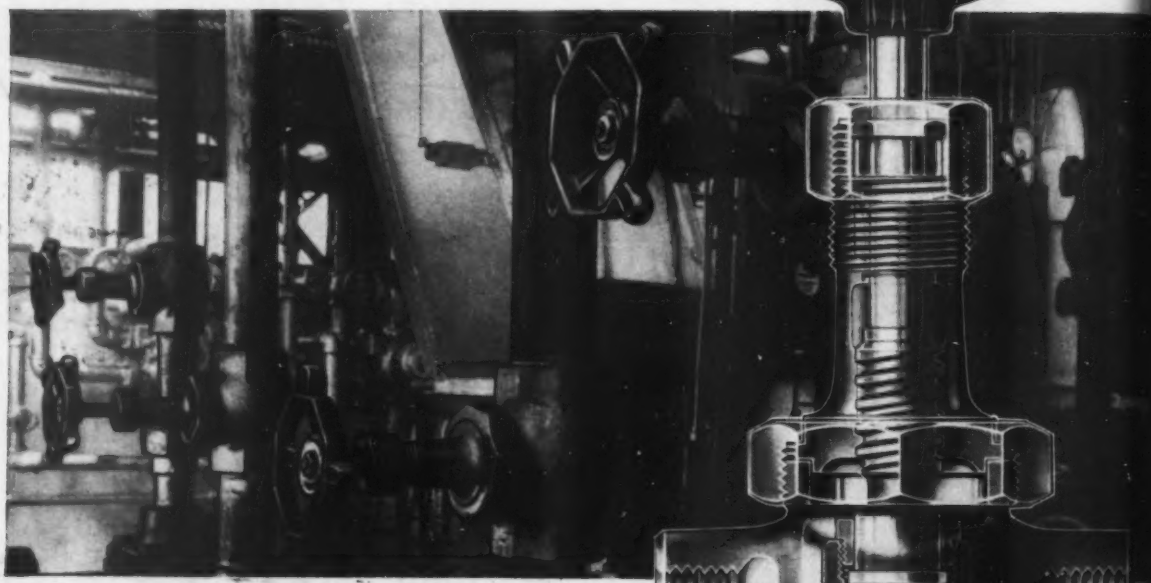
GLUE DIVISION
4201 South Ashland Avenue • Chicago 9, Illinois

You Can't Find the Cost of a Valve on a Price List



With today's high maintenance expense, the cost of keeping a troublesome valve in repair can dwarf its original price in a few months' time. The minute a maintenance man touches a wrench to a valve, its cost is often doubled. That's why the purchasing trend is to *top quality* —the longest-lasting, most dependable industrial equipment on the market. And in the valve field, that means Lunkenheimer . . . famous for quality and maintenance-free service since 1862. The Lunkenheimer Company, Box 360 Annex Station, Cincinnati 14, Ohio.

The cost of a Lunkenheimer Valve gets smaller...and smaller...and smaller... with each passing year of dependable service

LQ600-150
150 lb. S. P.
300 lb. W. O. G.

LQ600-200
200 lb. S. P.
400 lb. W. O. G. 550°F.

¼ to 2 inches

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Review Actual Case Histories from the Files of Industry on
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L-4

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LUNKENHEIMER
THE ONE *Great* NAME IN VALVES

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